AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Reg. U. S. Pat. Off.

Vol. 66 No. 9

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Contents

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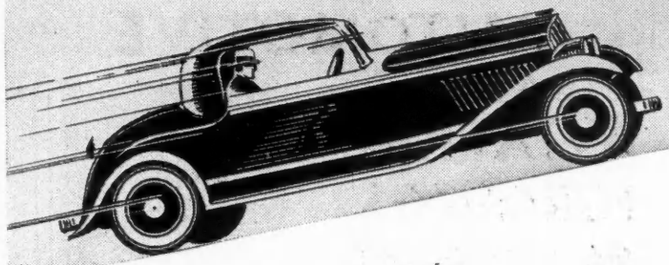
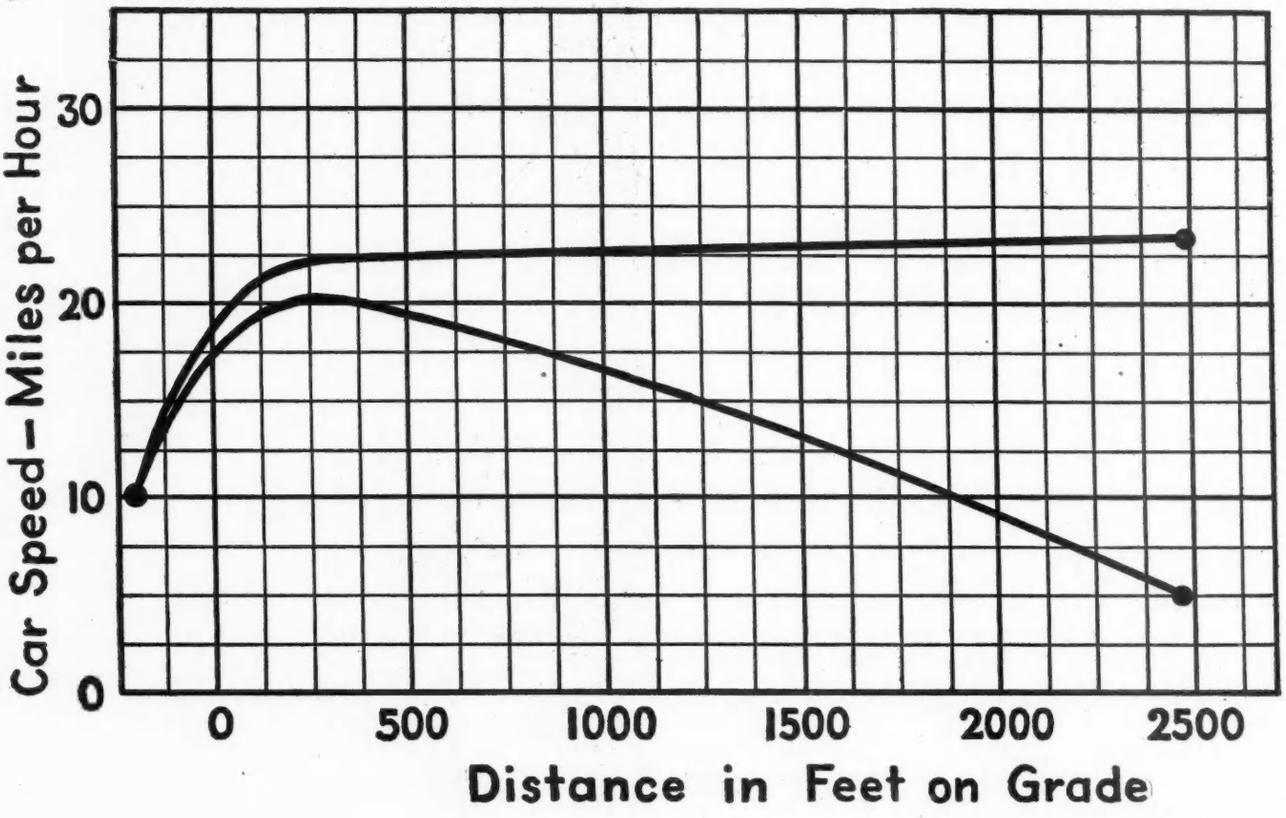
HIGH





12% GRADE REVEALS STRIKING DIFFERENCE IN PERFORMANCE. Two cars of identical size, weight, and engine equipment *except* for cylinder heads approached the test hill in high gear, running side by side at ten miles per hour. At a given point just before reaching the grade both accelerated to the full power of the engine. The graph above tells the story of car speeds after that point. The car with the higher compression head (5.6 to 1) reached a speed of twenty-two and a half miles per hour soon after starting up the climb. Thereafter it maintained that speed (with slight acceleration) until the top of the hill was reached. The car with the lower compression head (4.8 to 1) reached a speed of twenty miles an hour BUT then lost speed steadily until at the top of the hill it was moving a bare five miles per hour.

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ETHYL GASOLINE

COMPRESSION— *Makes the Grade*

AUTOMOBILE sales during the past two years have emphasized the importance of performance. Better performance sells cars. Better performance in new cars is putting older models out of date.

The outstanding sales lesson of the past three years in both the automobile and the gasoline industry is this: *The American public is willing to pay for performance.*

A staff writer of the Oil and Gas Journal quoted the president of a leading automobile manufacturing company as estimating "that 2,000,000 automobiles will be bought in 1932—and that the feature of the 1932 automobile engine will be a higher compression ratio. Refiners looking beyond 1932, 'when times will surely be better,' may give thought to the recently released figures which show that about 13,000,000 of the automobiles now in operation are at least five years old."

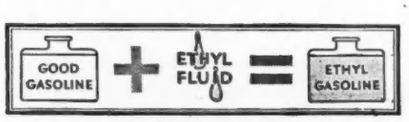
The fact is that nearly every major car manufacturer in the country is now offering either a standard high compression line or optional high compression heads. The competitive superiority of these cars is going to make old cars and *some new cars* look pretty bad on the basis of comparative performance—unanswerable argument on the road.

The hill-climbing test illustrated above is a fair example. It reveals the relative merits of the standard low compression head and the optional high compression head now being sold by a manufacturer of light weight cars. With the 4.8 to 1 head this car loses speed quickly on a 12% grade and is forced to shift gears. With a 5.6 to 1 head the same car maintains its speed and gains slightly. That all increases in compression produce corresponding improvements has been demonstrated repeatedly in cars of every price class.

The day of high compression is here—true—but high noon of that day is still distant enough to present competitive opportunity to those manufacturers who take greater advantage of high compression now. Proper fuel is already universally distributed and regularly used by a large share of the potential customers for *your* new model.

The survey recently completed by the U. S. Bureau of Mines shows that the average anti-knock rating of premium priced fuels has increased appreciably since a similar survey one year ago.

On March 1, 1932, the minimum anti-knock standard of Ethyl Gasoline was raised to a new level. The new Ethyl Gasoline has sufficient anti-knock quality to develop the maximum performance of engines of considerably higher compression ratio than even the high average of 1932 models.



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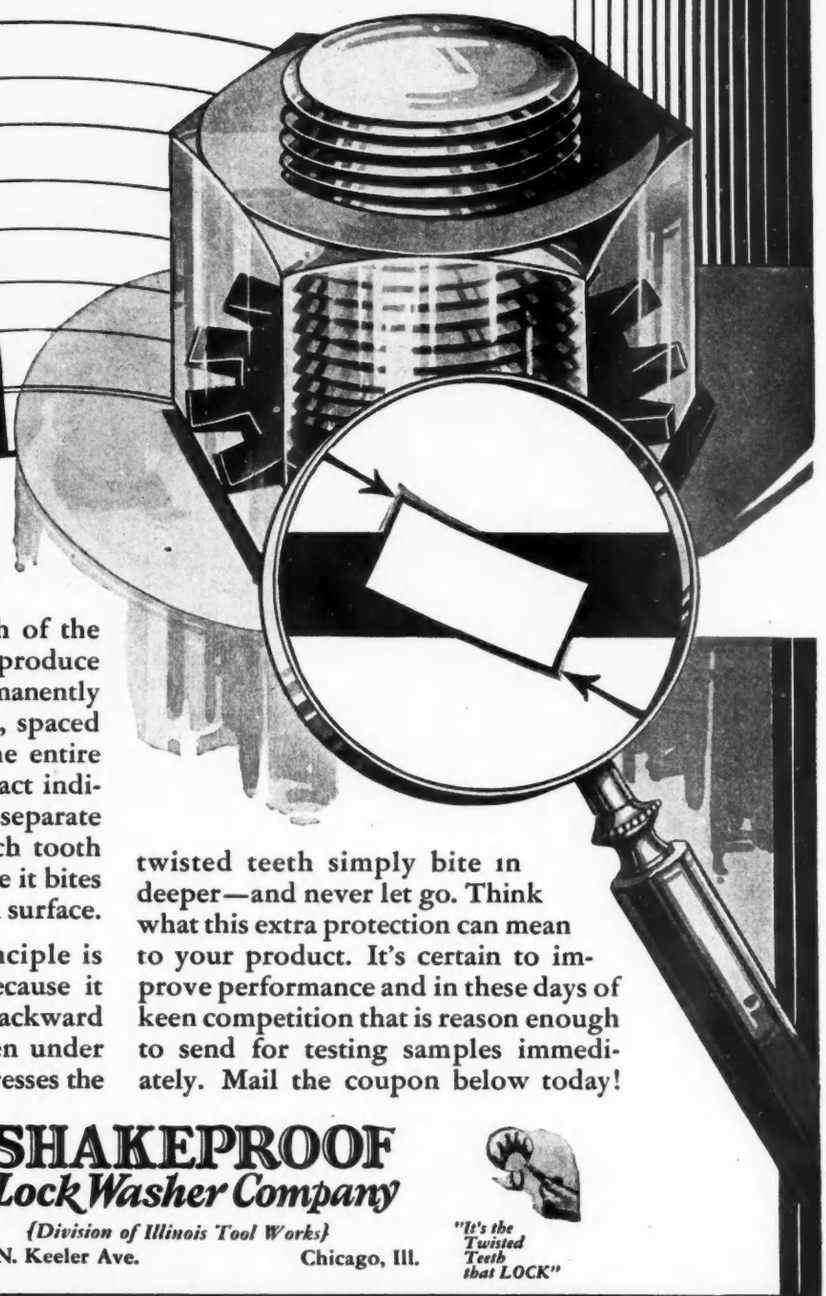

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1,604,122
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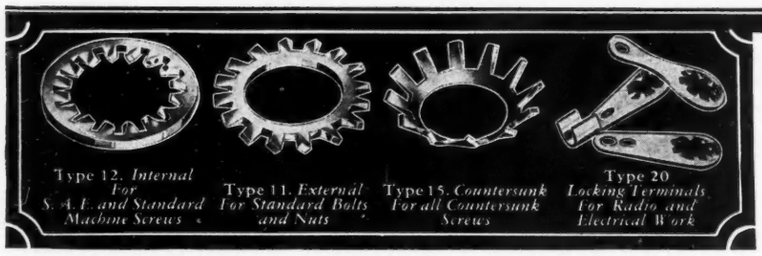

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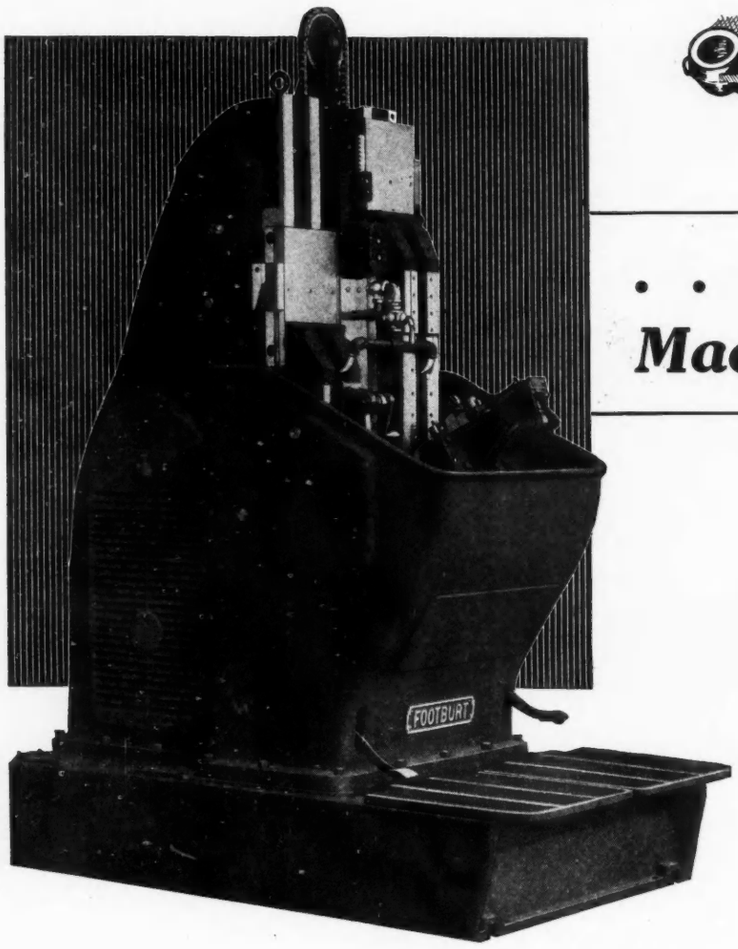

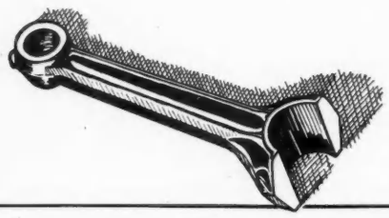
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. . . An Improved Machining Method


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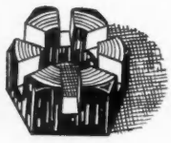
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AUTOMOTIVE INDUSTRIES
VOLUME 66 — MARCH 5, 1932 — NUMBER 10

Tractor is King in Soviet Russia, Leading Huge Automotive Plans

by Walter L. Carver

IN the face of handicaps of staggering magnitude affecting materials, personnel, contributory industries, transportation, and management technique, automotive development probably is proceeding at a more rapid rate in Soviet Russia than in any other country in the world. Five years ago, Russia had no automotive capacity except one small, struggling truck plant which had been put together from equipment scattered all the way across Siberia from Vladivostok as the result of a wartime project. Nothing but that and a keen appreciation on the part of some of her leaders of the place of automotive power in modern national economy, and an idea for centralized control, coordination, and direction of national development, which since has aroused world-wide interest, speculation and criticism as the Five Year Plan.

Today Russia has in operation three of the largest tractor plants in the world with a fourth in the offing. A 2½-ton truck plant which from the standpoint of adequacy and excellence of equipment has no rival anywhere went into operation three months ago. This plant with its related companion heavy truck plant is aiming at an output of 25,000 units during this year. The potential capacity is several times this figure. Three Ford assembly plants are in operation and the buildings comprising the Ford plant at Nizhni-Novgorod were completed last November. Although some of the equipment is still to be installed, the program of this plant calls for the production of 70,000 passenger cars and trucks during the current year. The capacity

WALTER L. CARVER returned to the United States two months ago after having spent most of the last two years in Russia as a special representative of General Motors Export Co.

During that period he was in constant contact with many of the highest officials of the Soviet government, spent many months investigating every phase of Russian industrial activity and, for weeks at a time, moved about in Russian towns and factories without the presence of official government guides.

Having spent the better part of a year in Russia as an executive of an American tractor company, prior to the present regime, Mr. Carver was peculiarly fitted to compare the old with the new industrial picture.

Here he tells frankly, fearlessly the whole stirring story of automotive development in Russia under the Five Year Plan.

Before entering the service of General Motors Export, Mr. Carver had a wide experience as an engineering production and general executive in automotive manufacturing plants, had made an enviable reputation in the field of market and economic research and spent some years in close contact with every phase of the American automotive industry as field editor of Automotive Industries. He terminated his connection with General Motors Export Corp. on his return to this country.

Automotive Industries takes pride in presenting the first complete, authoritative, unbiased picture yet printed of what's really going on in Russia in automotive development.

Sojuzfoto courtesy Amtorg Trading Corp.

Assembly shop of the new AMO automobile factory in Moscow

of the plant is rated at approximately 150,000 cars annually.

At the beginning of the Five Year Plan, in 1928, Russia had approximately 20,000 automobiles, chiefly trucks. With few exceptions, these and their passenger cars in relatively high-priced brackets, were imported. Their control figures call for a domestic production of 290,000 units in 1934 and a national registration exceeding 600,000. Whether or not these figures are completely realized, the gain expressed percentage-wise will run almost into astronomic proportions.

In the Russian vernacular, these plants comprise the "front line of the automotive front." Up to now, development of supporting industries has lagged somewhat in comparison to these achievements. Steel, for instance, has been and is one of the critical items and lack of it will probably constitute a drag on production figures for some time, although some of the larger mills are turning from statistical to actual production. With these new facilities and the added experience which only time and contact with the job can give, the prospects for adequate supply coupled with closer analysis and better physical qualities are anything but negative. Accessory and parts plants are springing up all over the country, a carburetor plant at Samara, a headlamp and small-stamping plant at Tula which has an age-old tradition for samovar craftsmanship, a cord-tire plant at Yaroslavl, starting and lighting units at Electrozavod works in the suburbs of Moscow. These are only typical items. In short, the infant industry is cutting its teeth and will be walking before long.

Due to the demands of the internal politico-economic situation, the tractor thus far has had priority over the automobile despite an almost unprecedented appreciation and demand for the latter. This appreciation is one of the amazing things about Soviet Russia and to some degree, supplies an index to the malleability of the people as a whole and their active desire for all the mechanical appurtenances of modern life. When I first went back in 1929, there were less than 30,000 cars and trucks in the whole country. Even in Moscow there were so few cars that one got to recognize them on the street. Yet practically every man, woman or child I ran into had something to say about the advantages of the automobile and usually wound up with some kind of a forecast of what he would do when he got his.

A parked car was the rallying point of a group not only of urchins but grown-ups and the technicalities

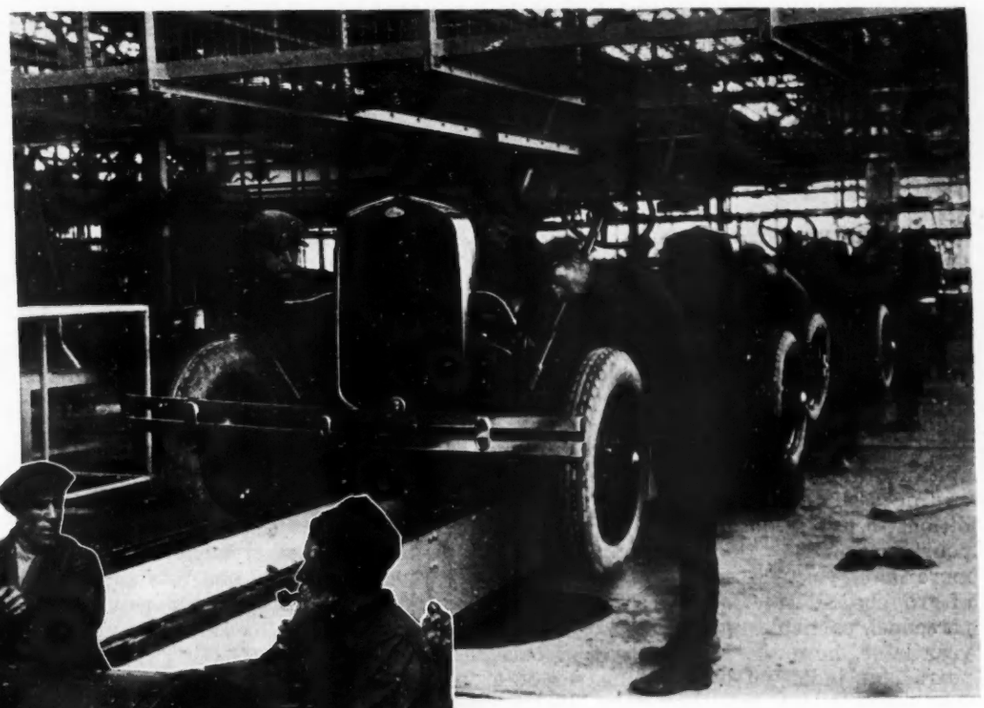
and economies of the motor car got a thorough airing.

The reasons for this emphasis on the tractor are too complex for discussion here. Wheat, the bread, is one of them, but for the purpose of this article, the situation can be boiled down into the statement that while two years ago these tractors were being purchased from abroad, today the country is on the verge of being completely self-supporting in this respect. Production still is far short of the potential capacity of each of the plants and the quality of material and workmanship is not yet up to our standards, but each added day's work sees something accomplished along both these lines.

Foremost in the public eye, of the tractor plants, has been the Stalingrad factory. This project was started about four years ago, the buildings were completed during the spring of 1930, equipment was installed during the summer and the plant got off to a bad start during the remainder of that year. But then one of the striking factors of Soviet progress came into play. The control of industry is centralized, results are checked up constantly, and failure or achievement are the hottest news. At any rate the success of this plant became an issue of national pride and the whole weight of the Russian people was thrown behind the program of the plant, directed from the top and supported all down the line. As the result, this plant turned out some 18,000 tractors during 1931 and is proceeding consistently at an average output of 110 tractors per day.

This plant produces the I.H.C. 15-30 type. The appearance of the product is good but technically, steel and cast-iron troubles have been drawbacks. At the time of my visit in late August, production then was averaging 80 units per day, 17,000 people were on the payroll. In relation to the output, this number is inordinately large and is open to criticism as are the ponderous personnel figures of most Soviet plants. I believe, however, that most American engineers who spend much time in Russia get over their first shock at this condition. Of course there are too many people around the place; a lot of them waste time and talk too much, and some of them smash up high-priced equipment, the production rate is low compared to the capital investment. But where four years ago there was nothing but a windswept sandpit on the bank of the lower Volga, 18,000 tractors were produced last year. Somebody must have learned something in that period and so many units of raw peasantry have become at least partially adapted to a more modern scheme of things. The millennium has not been achieved, it never is in human affairs; but somebody has visualized a problem and then has done something about it, and somebody is learning by making mistakes. Late last autumn, another plant at Kharkov, which is to all practical purposes a duplicate of Stalingrad, went into operation. Construction work on this plant was started in March, 1930. Although the difficulties were greater in this case, the lessons of the former cut the construction and installation time almost in half. Each of these plants has a potential capacity of at least 50,000 tractors per year. Each of them like all Russian plants is a social as well as purely industrial institution with complete housing facilities, schools, clubs, restaurants, etc., all built in a unified scheme.

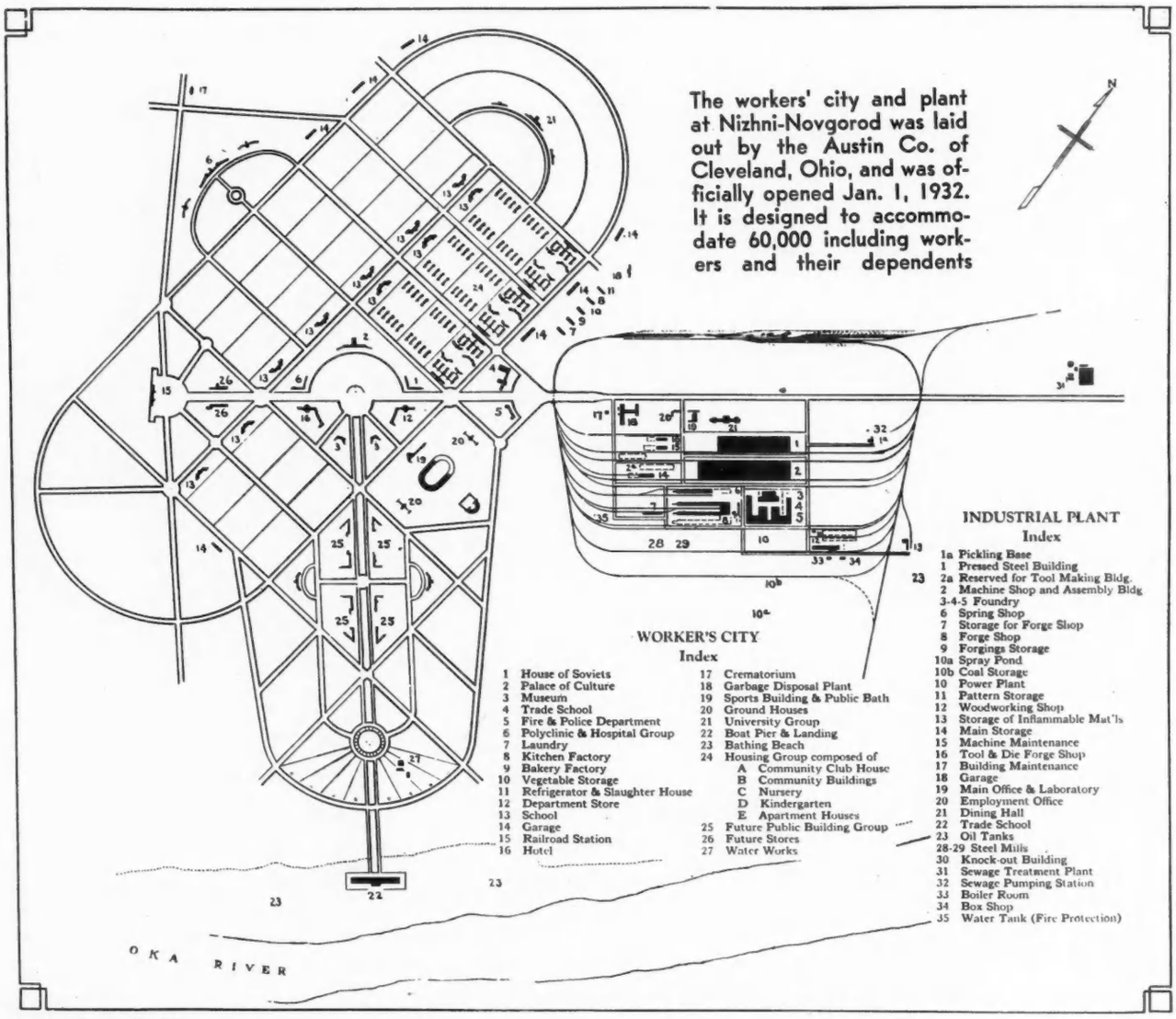
Third in the list of existing tractor plants is the Red Putilov plant in Leningrad which was the first in actual operation and produced some 20,000 modified Fordson tractors during 1931. This operation grew up within a general engineering plant which was the



Assembly line of the O.p.s. in the U.S.S.R.

Photos from Press Cliche

A tractorist on a collective farm exchanging views with a peasant



Courtesy The Austin Co.

oldest in Russia with a history of more than 100 years. In one group are foundries, a steel plant of relatively small capacity, and shops for the production of locomotives, rail cars, Diesel engines, textile machinery and a variety of marine and general construction. Within the last two years the tractor plant has been entirely rearranged and enlarged, the outstanding additions being a modern forge shop and continuous pouring foundry. Upon my first visit since the war, more than two years ago, I got the definite impression of groping and uncertainty on the part of the working personnel, particularly as related to the new shops. A year later, however, a great part of this had disappeared, as indicated by the comment of a forgeshop man from Detroit who was serving as inspector and instructor. He said: "Our rate is not what it should be yet; they don't push the hammers enough; but we're getting some place."

The fourth tractor project is at Cheliabinsk in the southern Urals. Buildings are approaching completion. This plant is designed for the production of 40,000 track-laying-type tractors of 50-60 hp. per year. According to the overall figures of the Supreme Economic Council, this plant is rated to produce 2,000,000 hp. per year as compared to Stalingrad's 1,500,000 hp.

Both Stalingrad and Putilov have been edging up toward figures of 2500 units per month recently. Kharkof produced almost 400 units in its first complete month of operation, November. Therefore a reasonable expectation for 1932, without including any estimate for Cheliabinsk and disregarding any official program, is 75-85,000 tractors. Which is no mean achievement for a country that has been labeled in many quarters as inherently incompetent from an industrial standpoint.

Motor Vehicles Too

Truck and passenger car manufacture is an important part of the Five Year Plan. Next week Mr. Carver will tell the readers of AUTOMOTIVE INDUSTRIES what is being done in Russia to meet motor-vehicle needs. There are gaps in the plan which will probably be taken care of in the NEXT Five Year Plan. More interesting pictures of Russian automobile plants will illustrate the second and final instalment of Mr. Carver's story. In AUTOMOTIVE INDUSTRIES next week (March 12).

JUST AMONG OURSELVES

1931 Breaks Record for 8-Cylinder Sales

INCIDENTALLY, there were more eight-cylinder cars sold in the United States in 1931 than in any preceding year. Think of it! 1931 sales of *something* were higher than ever before. Don Blanchard, *Automobile Trade Journal* editor, dug out this bit of information in the process of getting together hundreds of other pieces of useful data for his big Annual Sales and Service Reference Number which appears in April.

Eight-cylinder car sales last year totaled 298,221 as against 276,598 in 1930 and 198,575 in 1929.

Despite this increase, however, sales of sixes dominated again in 1931 with a total of 977,829, just as they did in 1929 and 1930. Four-cylinder sales took the biggest drop, both actually and relatively, running only 625,811 in 1931 as against 1,143,945 in 1930.

'Twill be a Busy Year

WATCH for the new models! This is going to be a year of changes. Ford is just announcing. The sparkling new Nash line has just been made public. More new ones are due within 30 days. And still more new ones after that before the year is half over.

This year's struggle for supremacy bids fair to resemble a forward-pass dominated football game. The opposing teams are all opening up with every play in their bags. The coaches are staying awake nights devising new strategy and new formations. And the new devices will be used right out on the field just as soon as possible.

There isn't going to be a minute's rest for anybody in the automotive industry this year, whether he is building automobiles, supplying parts or raw materials to people who are building them, or battling for bigger share of the huge replacement market. It's developing into a year where the most active, the most energetic firms will win. It's already proving to be a more exciting year than 1931 and we still believe it will end up by being a more profitable one.

Stretched Sales Mark Possible with Effort

THE 1932 market for automobiles probably can be increased from the expected 2,000,000 domestic sales to a total of 2,500,000 by improved retail sales management, more intelligent and vigorous effort by retail salesmen.

The total possible market, of course, always is limited by purchasing power. But this year we know for certain that the American people have far more purchasing power than is now being brought into action. If the men selling automobiles at retail this year do not rest content with trying to sell their particular car in opposition to some other car; if they are willing to do the work and selling necessary to *bring people into the market*, our total *profitable* sales this year may be 500,000 more than otherwise would have been the case. And 500,000 cars will mean an added retail volume of something like $340,000,000.

So says Paul G. Hoffman, president, Studebaker Sales Corp. of America, and he says truly.

Let's go!

Instruments Beat Guessing Contests

DR. F. A. MOSS has fully converted us to the idea that some quantitative means of measuring riding comfort have to be developed if we are ever going to get any place with that important problem.

He had a group of about a hundred people in the room listening to him talk at the S.A.E. annual meeting and had them guess the temperature of the room; also had them guess a time interval. He used the wide variations in the guesses to illustrate his point that every human being finds it nearly impossible to describe his feelings in quantitative terms. And yet it is on just such inaccurate and confused data that today we have to try to design riding comfort into automobiles.

There are many things which occur within our bodies about which we know nothing, Dr. Moss pointed out, emphasizing that we must find means of getting objective instead of subjective measuring means for determination of riding comfort.

The wabblemeter, of course, has been the first definite step in this direction, and there are indications that this instrument will get better understanding and use from automobile engineering departments in the future than in the past. New instruments being developed include a visiometer for measuring vision changes and a reaction timer to measure the time necessary to get the foot from the accelerator to the brake.—N.G.S.

One Six, Four Eights Power New Nash

From sloping fenders to smart beavertails, bodies emphasize sweeping design

Ride control and free wheeling are standard

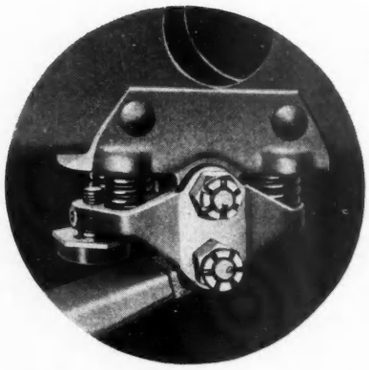
Stiff X-type frame introduced

by Don Blanchard

FIVE different series of cars, one with a six-cylinder and four with eight-cylinder engines, will make up the Nash line for 1932. All of the 27 body models offered are of entirely new design and are characterized by longer and lower construction, vee radiators, longer hoods, sloping windshields, door louvers, beavertail rears, and fender and molding treatment accentuating the appearance of length. Single-bar, full-width front and rear bumpers are standard throughout the line, as are metal tire covers. Overall height has been reduced in every case, and all bodies have more leg and elbow room.

Ride control and free wheeling are standard equipment. All models have unusually stiff X-type frames, longer wheelbases, more power, rifle-drilled aluminum connecting rods, floating piston pins, Purolators, Viscon oil coolers (except on the 1090), larger tires on wood or wire wheels with drop-center rims, longer springs, new oil-tight universal joints of Nash design, and wider treads. Centrifuse brake drums are used on all eight-cylinder cars, while the three overhead-valve eights have worm gear-driven rear axles.

The five series of cars consist of the 1060 L-head Big Six, the 1070 L-head Standard Eight, the 1080 overhead-valve Special Eight, and the 1090 overhead-valve Advanced and Ambassador Eights. Prices range from $777 to $2,055.

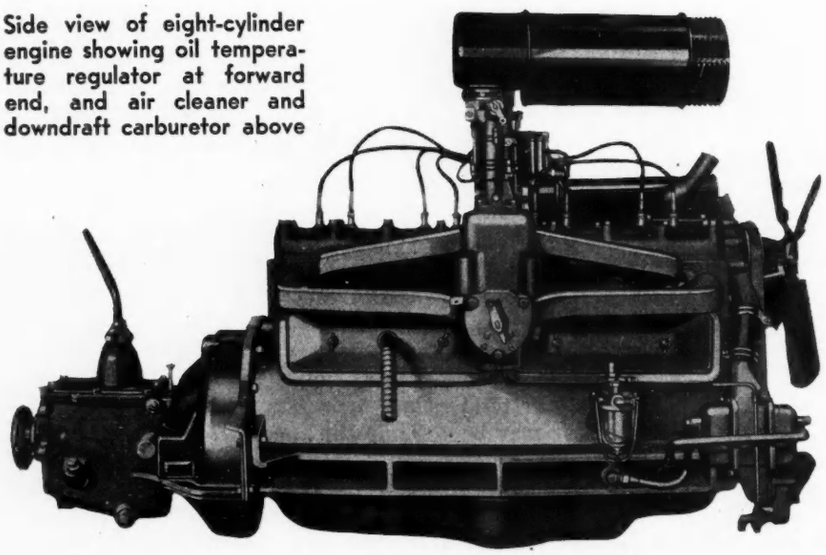


Road-shock eliminator with rubber bumper

Unusual precautions were taken to assure quiet operation. Bodies, of course, are all sound-proofed, and in addition rubber has been used very generously to prevent the transmission of noise and vibration. Rear axles are rubber-insulated from the springs, and the same is true of the exhaust pipes and mufflers. The mufflers themselves are of an asbestos-insulated design and are supplemented by resonators operating on the Maxim silencer principle. Intake silencers in combination with air cleaners are, of course, provided, and these are of increased size, in keeping with the greater power output of the engines. Rubber bushings are used in all shock absorber links and, on the L-head models, in the spring shackles and anchors.

Powerplants are completely rubber-insulated from the frame and are supported at five points, the fifth point being under the transmission case. This support is provided by a drop-center cross

Side view of eight-cylinder engine showing oil temperature regulator at forward end, and air cleaner and downdraft carburetor above



Models; Aerodynamic Lines Mark Bodies

bar mounted at each end in rubber on the forward legs of the X-frame member. The connection to this member is provided by a stud in the bottom of the transmission case.

The X-type frames used on all models are of the same general design. The rear legs of the X start at the rear kick-ups of the double-drop frames, while the forward legs are carried forward inside of the frame side rails to the front engine supports, at which point, approximately, they are bent inward and meet at the center of the front cross-member. The legs of the X are of channel section and in the Ambassador frame, the front and rear legs on each side of the X are in one continuous piece. On the 1090 models, the webs of the frame side rails are punched out for lightness.

Clutch and brake controls are mounted on the frame in the new cars, and the hand brake is on the left side of the driver. Due to the change in the frame, a complete redesign of the brake hook-up was necessary. Cable control is used on the 1080 and 1090 series. The shock absorber regulator control is located centrally just above the instrument panel, while the roller-type, free-wheeling clutch is thrown in or out of engagement by means of a short lever projecting up through the floor of the driving compartment a short distance to the rear of the gearshift lever.

The underslung worm axles used in the 1080 and 1090 jobs are of Nash design and manufacture. Before assembly, the spline-mounted worm wheels are heated in boiling water. To secure them in position, they are cold-riveted to the carrier, the rivet heads bearing on the carrier flanges and not on the bronze. All differential gears and pinions are fitted with thrust washers, and under ordinary conditions it will not be neces-

Nash Model 1060 five-passenger sedan

Features of the Nash Models

	1060-Six L-Head Big Six Series	1070-Eight L-Head Standard Series	1080-Eight Overhead Valves Special Series	1090-Eight Overhead Valves Advanced and Ambassador Series
Wheelbase inc. from..	114 to 116 in.	116¼ to 121 in.	121 to 128 in.	Adv. 124 to 133 in. Amb. 133 to 142 in.
Horsepower inc. from..	65 @ 3200 to 70 @ 3000	78 @ 3300 to 85 @ 3200	94 @ 3400 to 100 @ 3400	115 @ 3600 to 125 @ 3600
Cyl. Bore inc. from....	No change	2⅞ to 3 in.	3 to 3⅛ in.	3¼ to 3⅜ in.
Pist. Disp. inc. from...	No change	227.2 to 247.4 cu. in.	240.3 to 260.8 cu. in.	298.6 to 322 cu. in.
Comp. Ratio inc. from.	5 to 5.1	5 to 5.1	No change	No change
Conn. Rod Weights...	22.5 oz.	21.25 oz.	24.5 oz.	32 oz.
Oil Filter	Purolator	Purolator	Purolator	Purolator
Oil Cooler	Viscon	Viscon	Viscon	
Rear Tread	59⅜ in.	59⅜ in.	60¾ in. (Front—58¾ in.)	60⅜ in.
Tires from	5.00 x 19 to 5.25 x 18 in.	5.25 x 19 to 5.50 x 18 in.	6.00 x 18 to 6.50 x 17 in.	6.50 x 19 to 7.00 x 18 in.
Delco-Lovejoy Shocks..	Single acting	Single acting	Double acting	Double acting
Brakes	Steeldraulic	Steeldraulic	Bendix 2-shoe	Bendix 2-shoe
Brake Drums		Centrifuse	Centrifuse	Centrifuse
Rear Axle Ratio from..	No change	4.73 to 4.45	4.46 to 4.43	No change; 4.86 opt.

sary to disassemble this unit during its life.

Taper roller bearings are used throughout these axles. Adjustment of the worm is by means of shims. A feature of the design is an oil distributor in the form of a sleeve surrounding the worm, except along the axis of contact with the bronze wheel. Double-row bearings are employed at the axleshaft ends.

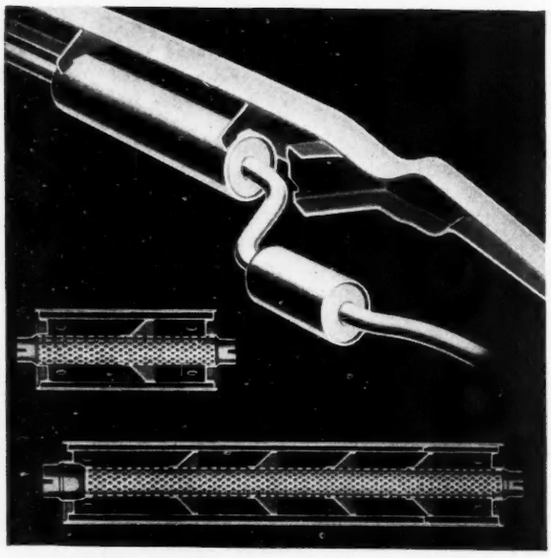
The bevel gear axles used in the 1060 and 1070 have stiffer housings, and the pinion carriers have been strengthened with ribbing. Reduction gears also are heavier, and the axleshafts are ⅛ in. larger in diameter. Single-row, taper-roller bearings are now used at the ends of these axles, instead of the double row design formerly employed. Pinion-shaft bearings have been enlarged and now are adjusted by means of shims.

Rear axles are further back with respect to the rear seat than in last year's cars, from 2 to 4½ in. in the different models. The result of this change is an improvement in riding comfort for rear-seat passengers. In addition, the reduction in overhang makes for better appearance.

Propeller shafts are, of course, longer on all models because of the increase in wheelbase, and in the 1080 and 1090 they are also of larger diameter. New Gemmer steering gears and spring-type tie rods are used on the overhead valve jobs, and on the L-head models the steering gears have been enlarged and strengthened.

The action of the road shock eliminator located at the rear of the left front spring on all models, has been improved by the addition of a rubber bumper to limit the movement and to soften the operation. On the 1080 and 1090 models the clearance between this bumper and the front spring is adjustable.

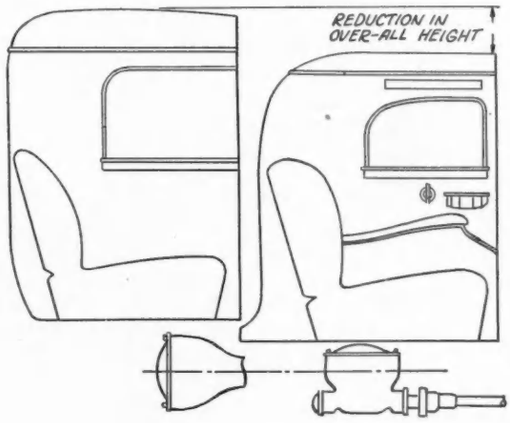
Both the six and eight-cylinder L-head engines develop more power. In both engines, compression ratios have been increased to 5.1, to take advantage of modifications in the combustion chamber design; manifolds have been enlarged and improved, and downdraft Stromberg carburetors have been adopted. In addition, the eight has ⅛ in. more cylinder bore. In this engine, the piston pin diameter has been increased to 13/16 in., the pistons are longer, and the oil-regulating ring is now 3/16 in. in width. Pistons in these engines, as well as in the overhead valve jobs, are of the invar strut, aluminum alloy type.



Showing interiors of the two-stage muffler and its installation on the chassis

Steel-backed, interchangeable bearings are now used in the connecting rod's big ends and to support the camshaft in both L-head engines. Viscon oil coolers are standard on the six this year, as well as on the 1070. In both cars, the cooler is located at the front of the engine on the right, which simplifies the water connections. Oil pumps and oil distributing systems have been enlarged in these engines, and in the 1060 the oil capacity has been increased to six qt. Gasoline lines are carried outside of the frame side rails to prevent vapor-lock. Timing marks are provided on the front flywheels to facilitate this important maintenance operation. Valve springs are heavier. Both models now carry coincidental steering and ignition locks.

Cylinder bores in both overhead valve engines have been increased ⅛ in. and the resulting gain in displacement, together with improvements in the manifolds and carburetors, have combined to give substantial increases in power output. In addition, on the 1090, valves have been enlarged, the intake now being 1¾ in., and the exhaust 1 19/32 in. Both the 1080

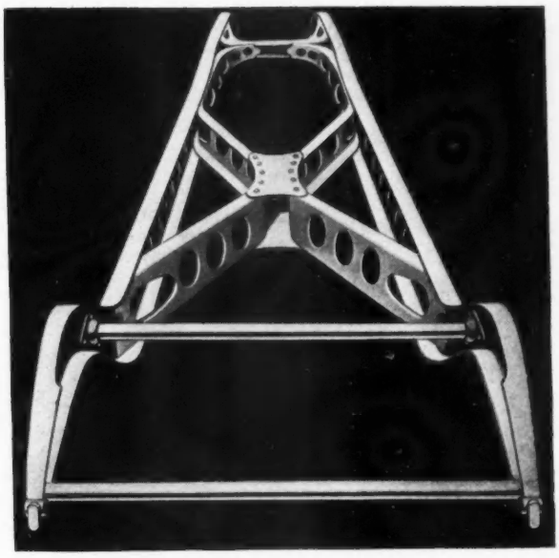


A comparison of heights of the old model and the new worm-driven type

and 1090 models have fans with unequally spaced blades for quietness, metal spring covers, and propeller shafts of larger diameter.

Among the features common to all models are new headlamp brackets and a new tie bar conforming in design to the streamline fenders, rubber-covered steel running boards, and new splash aprons. Inside of the bodies, at each end of the new instrument panels, there is a glove compartment. Adjustable sunshades are provided. The front seat has an easy-operating roller adjustment. Inside window moldings are one piece, window lifts have been improved to give easier operation, all doors may be locked from the inside, and the rear-view mirror is of the non-glare type. The 1080 and 1090 models also have twin windshield wiper motors and wedge-type door dovetails.

All sedans and coupes are wired for radio. Mohair upholstery is standard for these body types on the 1070 and 1060, with Bedford cord optional, while on the 1080 Bedford cord is standard, with mohair optional. The 1090 sedans and coupe have broadcloth as standard with mohair optional. The 1080 and 1090 sedan rear seats have folding center arm rests, front doors are wider, the bodies are longer and 2 in. wider, and the front seat back is 2½ in. higher. The front



A good deal of the metal in the webs of frame members is stamped out to reduce weight

seat backs in the 1060 and 1070 sedans are 1 in. higher, and these models are equipped with smoking sets.

The convertible roadsters have rumble seats and are furnished with either leather or Bedford cord upholstery. The same upholstery option is offered on convertible sedans, which have two doors on the 1060 and 1070 series and four doors on the 1080 and 1090 chassis. Coupe bodies may be had either with or without rumble seats.

Man and Technics in Historical Perspective

THE cult of Juggernaut finds its ablest Western exponent in Herr Oswald Spengler, who in a recent work* interpolated between his earlier "The Decline of the West" and a forthcoming synthesis of world-history revalues the significance and destiny of technological progress. History to Herr Spengler is not simply a succession of events beginning at a point in time and continuing until the present. Civilization as we know it is not a progressive step from previous cultures established by the Greek-Roman world, for example. Each civilization carries out its own destiny through all the manifold activities of man, including the technical. In considering the significance and final result of present technological development, then, the cards must be shuffled so that this development is viewed simultaneously and comparatively with the technological aspects of earlier civilizations, which have completed their historical destiny.

Technics is defined by Herr Spengler as "the tactics of living." Technical development proceeds with the effort of man to conquer his environment. It is part of an age-old attempt to enslave nature and make her the slave of man. Modern engineering, as we know it, has gone further than any other earlier technical development, with the aid of mathematical-physical concepts which approach the fundamentals of knowledge, the limits of the knowable.

Nevertheless, the author concludes, no matter how far technological conquest of nature proceeds, nature is always the stronger, and technological progress will eventually break down, as it has done in previous cultures, because it is fundamentally opposed to the natural development of organic life.

In astronomy, for example, we can measure and describe distant constellations but never, never, shall we be able to stop the course of a plunging meteorite.

Even now, reasons Herr Spengler, technological progress has reached the point where it defeats its own ends. We build so many automobiles that in some congested sections it is easier to get from place to place on foot. Unemployment is tending to become a permanent tragedy for the Western highly-mechanized nations. Wars result from the efforts of industrialized nations to find new markets for an overproduction of goods and people.

The civilization or culture in which we find ourselves, to which we have been born, will proceed along its destined lines. Technological progress will go on, Each new discovery carries with it the *necessity* for further work. We cannot stop. Acute observers, unconsciously reasoning along Spenglerian channels, have suggested a moratorium on research, so that the absorption of technics might catch up with its possibilities. But Spengler shows that such a measure would be only an incident in our technological destiny. We approach everything from the point of view of technics. Certain individuals will react strongly to this condition. There will be back-to-the-farm and back-to-nature movements, but they will only serve to intensify the inevitability of the main current.

We of the West European-American culture, who think technically, and progress technically because we *must*, have given the backward races a dangerous weapon by exporting our machinery and brains to them. To the older untechnically conditioned races, modern technical developments are viewed *only* as a new weapon for conquest.

It would be wholly unfair to imply that the above remarks are an adequate review of a profound, stimulating (if "pessimistic") consideration of the eventual destiny of our technical civilization. Every person who has even a small part in the development of the more obviously technical sides of this civilization (such as the designing or handling of automobiles) will be interested in "Man and Technics," which is simpler in presentation than Spengler's earlier work.—*Herbert Hosking.*

*"Man and Technics" by Oswald Spengler. Alfred A. Knopf, New York, 1932. $2.00. Originally published as Der Mensch und die Technik. C. H. Beck'sche Verlagsbuchhandlung. Munich, 1931. Translated by Charles F. Atkinson.

Highways Glisten With Deep-Sea Lusters

Science borrows sheen from fish and mercury, to compound bright hues for automobile coachwork

by Joseph Geschelin

ENTHUSIASTIC public interest at the National shows swung the pendulum in favor of the new pearl essence finish which adorned so many 1932 models. Consequently it is not surprising to find rough estimates placing almost 50 per cent of the output of one medium-priced line and about 10 per cent of a high-priced line in this new opalescent finish.

What is there about this finish that impelled this response? It is difficult to describe such characteristics as color value, lustre, sheen and the like. But one gets the definite impression of depth of color and a striking brilliance due to reflection from myriads of pearl essence crystals. Several different effects may be produced. One type is brilliant, flashy, and with a decided silver sheen due to presence of either a large volume of pearl essence in the pigmented lacquer or a smaller amount in clear lacquer over the regular finish.

Another type is more subdued, richer in value, and tends to produce an impression of smoothness without appreciable flash. Between these extremes, the artist as well as the paint technologist has a wealth of contrast to work with.

At present the market affords two kinds of pearl essence, both apparently giving similar results. The first is the natural product (1), a silvery crystalline compound (guanin) present in the skin of certain species of fish. It is found chiefly in the fish scale, and the resulting product has been called fish scale for want of better nomenclature. Historical and descriptive data of great interest have been covered fully in a publication of the U. S. Dept. of Commerce (2).

The other pearl essence is formulated from a synthetic product (3) called H-scale; this material is a crystalline form of mercurous chloride (HgCl). Like other synthetic products, it is designed to be lower in cost than the natural material which it supplements or replaces. The synthetic product moreover has already stood the test of production in the manufacture of fancy toilet articles of celluloid.

(1). Suppliers of record are Jos. H. Meyer Bros., Brooklyn, N. Y.; Pais Pearl Products Co., Inc., 65 Nassau St., New York City.
(2). Bureau of Fisheries Document No. 989, by Harden F. Taylor. Published in reprint form by the Rinshed-Mason Co.
(3). Manufactured by the Celluloid Corporation, N. Y.

In appraising the value of any new finish, the user, in this case everyone concerned with the manufacture and merchandising of automobiles, must have positive answers to each of the following questions:

1. What is the cost?

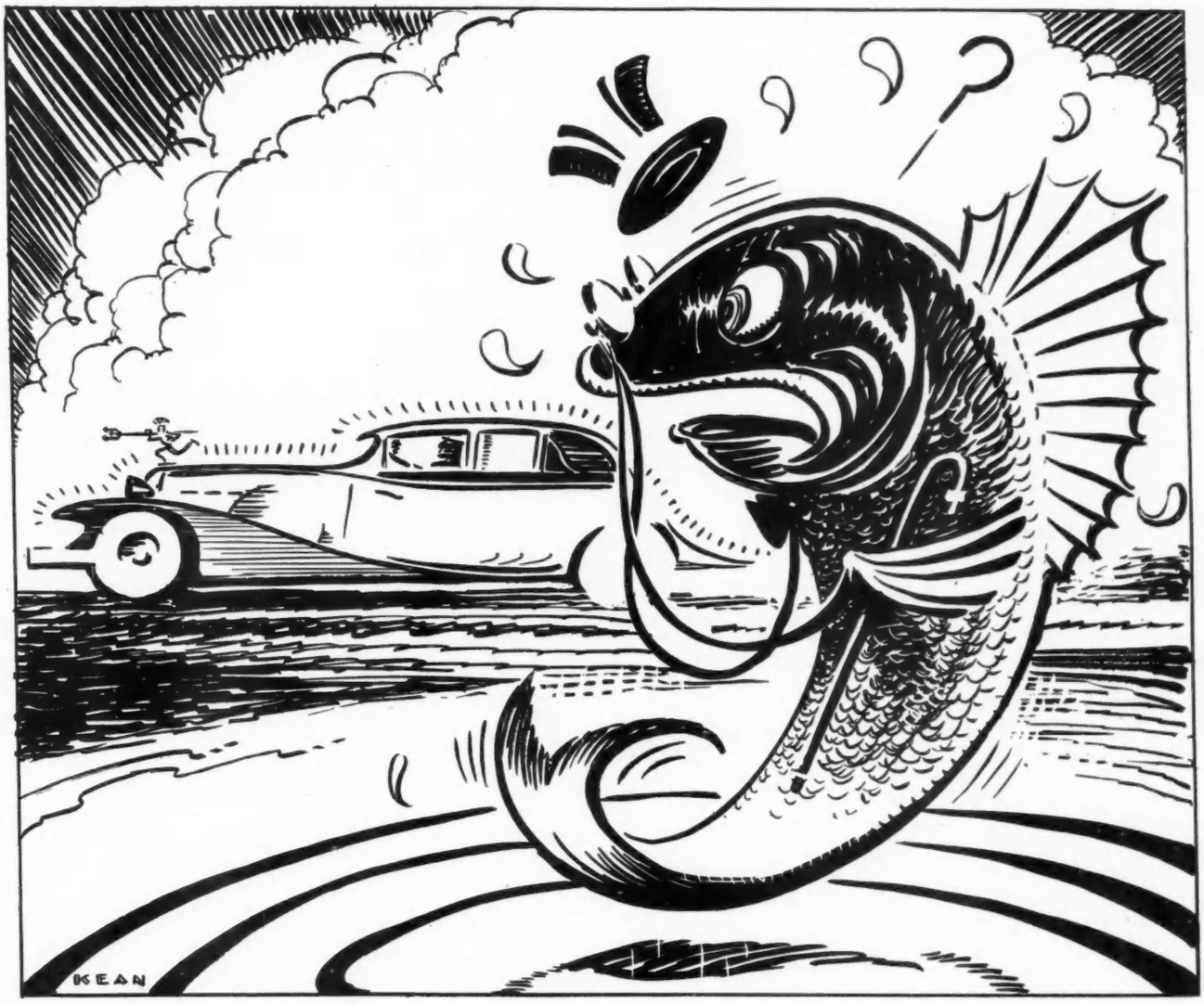
2. How does its life compare with regular lacquer finishes?

3. How does the finish weather so far as color is concerned?

Because 1932 marks the first real production venture in the pearl essence finish, answers to these questions can not be as positive as we might like. We know for the moment that costs are high. But that is due largely to the cost of the fish scale ingredient rather than to any complication in production methods. It is interesting to speculate on the immediate possibilities in this connection. For example, only a few years back the fish scale fetched about $150 a pound; today it sells for about $8 to $10 a pound. Isn't it reasonable to assume that with increased demand the price may go still lower even to the point where the cost of the finish may be very close to that of the present lacquer finish.

Some tendency in this direction already is offered by the synthetic product, H-scale, which sells for about a fourth of the price of the natural fish scale. One estimate of the cost of pearl essence lacquer places it at about four times the cost of lacquer per gallon.

Durability is a moot question. The only reliable figures are based on laboratory tests, inasmuch as production cars have not been out long enough to judge. It has been claimed, however, that pearl essence finish is as durable as the regular lacquers. On the other hand, one reliable source estimates its maximum life at 15 to 18 months. In commenting on this, the Graham paint technologists advise that they have observed jobs two years old and have found the finish in good condition. Test panels of pearl essence have stood up for months in Florida side by side with others finished in regular lacquers. However, there is plenty of room for argument on this score because life will depend a good deal upon the way in which the finish



Tiny crystalline particles found on scales of fish, secreted there by nature for camouflaging purposes, are used in the latest car finishes

is formulated. This is evident from the discussion in the following section.

Production methods in connection with this new finish are running the usual gauntlet of experience by trial and error. Which is the way any worthwhile process is developed. In the present stage of development, the following lines have been pursued in production:

1. Because a considerable volume of fish scale is required when formulated directly in pigmented lacquer, some cars have been finished by applying a coat or several coats of clear lacquer containing fish scale directly over the regular finish. This produces a flashy, silver lustre at low cost. But the life of this resulting finish is no more or less than the life of the clear lacquer used as the vehicle.

2. A second method is that of formulating the required amount of fish scale directly with the pigmented lacquer. The body is then finished in the regular way except that several additional coats may be necessary if the lacquer tends to run; also where a deep color value is desired. At present this type of finish will cost the car owner from $50 to $150 extra.

3. As a logical development of this, the market now affords a "Pearl Lacquer" (4) formulated from special materials so that the factory or repair shop can get a finished product without the necessity of mixing the ingredients. The makers of this product claim that it produces a finish with a greater degree of iridescence.

At present, the duPont Company is prepared to supply pearl essence in the following colors mixed ready to spray over surface coats or polished Duco areas:

Two golden brown sequence variations developed from a rich brown base color, called Sun Glow Pearl and Sun Glow Pearl Deep.

Three blue values, one a deep, lustrous, pure blue base and two sequence variations made up of considerably lighter blue bases.

In addition, a number of striking effects are offered in pearl grays to take the place of gunmetal finishes.

So far as we can learn, the procedure in the paint

(4). One manufacturer of record is the Rinshed-Mason Co., Detroit.

shop is just about the same as with the regular lacquers. It may be sprayed or brushed but should be permitted to flow smoothly.

H-scale has been undergoing considerable experimental work in preparation for automotive demand. For one thing, certain questions of toxicity and corrosion have been thoroughly threshed out. So far as toxicity is concerned, it has been proved that the material is at least as safe to use as a lead base primer. Corrosion is important because it is found that metal containers require protection from chemical action. The remedy is to use glass, earthenware, or agate containers. For metal parts complete protection against corrosion is offered by silver plating. Authoritative results based on laboratory and commercial scale work have been gathered together and will appear shortly in the form of an article.

At the National shows, pear essence finish was featured by Cadillac, Graham, Hudson, Chrysler, Buick, Lincoln, Auburn and others. Several of these manufacturers have gone into it on a production basis. As mentioned earlier, the extra cost per car runs from $50 to $150, although in some cases a part of the charge may be absorbed so as to hold down the delivered price.

Granting that the public is sold on this finish, what are its future possibilities? Of course it stands to reason that there will be no future at all if the finish fails to stand up. This is a stabilizing influence because the paint technologist must act quickly in the selection of the most promising production procedure. Cost is another determining factor, since obviously the growth of demand will depend upon the possibility of producing the finish at reasonable cost. This will focus attention upon the choice of primary materials.

Technically, pearl essence provides many desirable features. First is the range of surface values varying in brilliance, iridescence, depth and tone. The second is the appearance of the finish in service as measured by owner satisfaction. Ordinarily when the car is dirty or dust covered, the effect of the usual finish is practically obscured. But the pearl essence will hardly suffer at all when viewed from a reasonable distance because the crystals continue to reflect and refract light rays up to the point where the dirt film becomes impenetrable to light.

The most striking effects of pearl essence are produced on curved surfaces since this permits of multiple reflection from crystal to crystal. That is why it is particularly pleasing on the bodies of 1932 with their air-flow lines, smooth curves, and a fine fairing of fender and body lines.

With a flow of cars into the field, new service problems are sure to arise in body repair shops. Just as soon as the procedure in the factory is established it should get out to service fields. Only in this way can the enthusiasm of the car owner be maintained, for it will be fatal for the proud owner of an opalescent finish to find that a slight traffic accident may ruin the entire job—because his service man can't repair it properly.

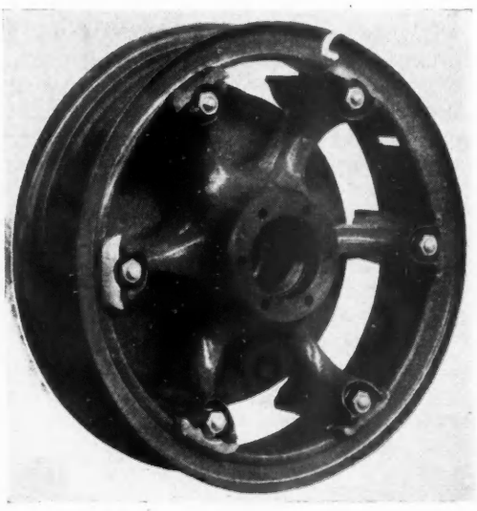
Is it too visionary to speculate on the possibility that some time in the near future pearl essence might be an optional finish supplied at no extra charge? What a potent sales feature this would be for any car. Yet the goal is within the range of possibility. Many other things about the automobile have been expensive at the start but large production pared them down to where everyone could have them. In a few years pearl essence shifted in price from $150 a lb. to $10 just from the impetus of the fancy toilet articles trade. What can automotive production do on such a basis as this?

Clark Producing Cast Wheels

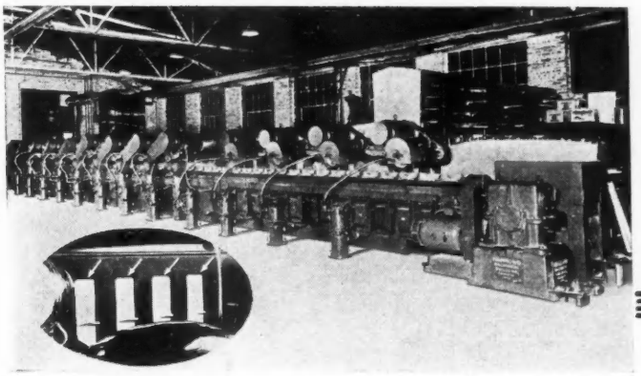
THE Clark Equipment Co. of Buchanan, Mich., has placed on the market a new cast wheel for commercial vehicles, as illustrated by the photographic reproduction herewith. The wheel is of the type in which the tire rim is mounted directly on the ends of the spokes, and is, therefore, without felloe. It is made in two parts, one comprising the hub and the brake drum cast integral, and the other the spoke spider. An advantage of this construction is that, since the brake drum is bored out at the same setting the seats for the bearings in the hub are machined, there is no possibility of the drum running out. The material used for the drum and wheel hub is electric furnace iron, and the well known advantages of cast iron braking surfaces are therefore assured. It is claimed for the wheel that, owing to the fact that the brake drum must run true with the hub, and to the use of electric furnace iron in the drums, long life is assured for both the lining and the drum. The spoke spider, which is a malleable casting, is mounted on the hub under pressure. Driving and braking torque are entirely taken through the wheel spider.

The wheels are so designed that a wheel spider for a single tire and one for dual tires are interchangeable on the same hub. Whether a spider for a single tire or one for dual tires is fitted, the location of the load with respect to the wheel bearings is substantially the same; in other words, the division of load between the two bearings in each rear wheel is the same whether a single tire is carried on the wheel or whether dual tires are carried.

The wheel being without felloe, its weight is relatively low, and it is pointed out by the manufacturers that the weight thus eliminated is at the rim, which very materially reduces the moment of inertia (or flywheel effect). A wheel with great moment of inertia reduces the maximum acceleration which it is possible to obtain under otherwise equal conditions, and it also increases the minimum distance in which a vehicle can be brought to a stop by means of the brakes from any given speed.



Clark spoked cast wheels with rim



PRODUCTION LINES

Polishing Automatically

Speaking of the latest in automatic polishing, look at the illustration above. Here is a machine built by the Hammond Machinery Builders, Inc., Kalamazoo, Mich., for polishing and buffing the top and inside edge of a hood ventilator. The work is 12 x 4 in. Production is about 900 per hour. Twelve polishing heads individually driven through Multi-V belt drives do the work. One of the distinctive features is the crawler-type conveyor with accurately machined cast-iron plates. Each head incorporates an automatic composition feeder. Cushion effect for the wheels comes from a spring and weight control arrangement.

Insuring Comfort

According to the *Bakelite Review*, a progressive molder has covered the top of his presses with asbestos cloth jackets. This insures better working conditions for the operators and saves fuel due to the elimination of radiation losses. Thus increasing efficiency and profits in one fell swoop.

Another Kink

A molder recently made some test pieces of a urea resin product, and discovered that when he tried to use a phenol resinoid material immediately afterward, the parts stuck to the mold. He found that this could be readily overcome by oiling the mold with No-Ox-id for one or two heats.

Jumping Forward

If plans go through, the S.A.E. will cooperate in a project to standardize grinding and machining finishes. This will mark one of the most constructive steps in machine shop practice in recent years. Don't think it is a simple matter to put this standard into usable form. It embraces two vital elements. The first, a definition of the standard has been attacked already. But the second demands the development of instrumentation for the automatic comparison between the work and the standard. That's something else for our instrument makers to think about.

Paging the Blue Sheet

Based on the idea that reference material can be made more valuable by sticking to technical facts, the Ludlum Steel Co. inaugurates the "Blue Sheet" for engineers and executives. The one on our desk describes Ontario Air Hardening Die Steel. Complete information is given concerning physical properties, heat-treatment and machinability. Should be of great interest to folks in body plants particularly.

Perm-A-Clor

The big machine tool and production issue of *Automotive Industries*, Oct. 17, 1931, showed for the first time the new Perm-A-Clor metal cleaning machine developed by Rex Products & Mfg. Co. They have just come out with an important announcement. To take care of close quarters and where space is limited, they can supply a vertical machine that gives the same results.

Cashing in Suggestions

Despite the depression and whatnot, the General Electric found it good business to encourage and pay for suggestions. No less than 19,595 were received in 1931. These netted the employees $55,739.

Gas Speeds Annealing

A gas-fired furnace 30 ft. long has been put to work by the Chase Rolling Mills to speed large scale brass annealing. Valuable data are expected on the success of bright annealing by means of this type of equipment.

Changing Hand Taps

According to a recent memo from S.A.E. headquarters, there is a proposal to change the overall length of standard hand taps as suggested by the German standardizing body. Those interested should get a copy of the S.A.E. memo dated Feb. 16, 1932, entitled, "Proposed changes in standard hand tap lengths."

And Proud of It

Westinghouse has just published a year book, "Engineering Achievements—1931." It covers the amazing range of scientific research in every phase of today's industrial activity. The last section tells about the marvels of Electronic research which are now in the experimental stages. Here's good reading for the asking.

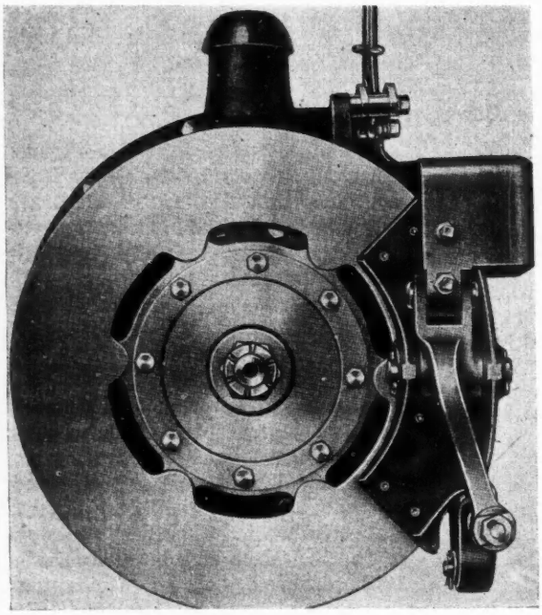
Electric Eyeing

Considerable interest is aroused by the proposal to standardize ground and machined surface finish. The crux of the thing lies in some acceptable means of comparison. Photo-cells have been tried but early attempts were unsuccessful. We understand that the problem is being attacked by several organizations working with photo-cells.

—J.G.

MANUFACTURING MANAGEMENT METALLURGY

American Cable Redesigns Tru-Stop Emergency Brake



New design of Tru-Stop emergency brake for trucks and buses

Intended for use as emergency or parking control on commercial vehicles, the device allows easy relining

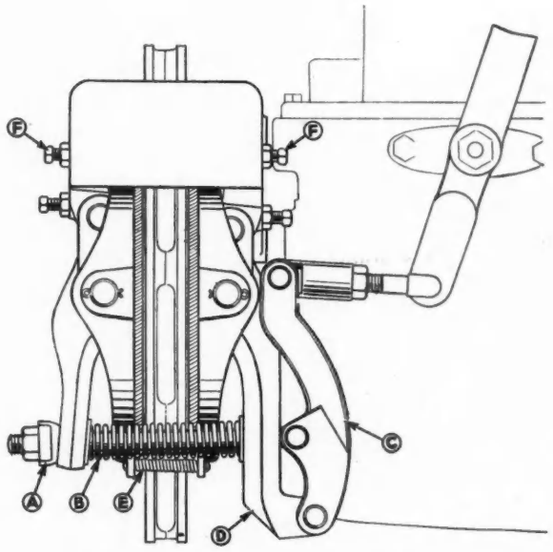
THE American Cable Co., Inc., Bridgeport, Conn., has recently brought out a new design of its emergency brake which has come into wide use on commercial vehicles. This brake consists of a ventilated disk mounted on the transmission main shaft where it projects from the housing, and a pair of shoes that are applied to opposite sides of the disk with uniform pressure, by means of a simple mechanism connected directly to the hand lever. The brake shoes are supported on levers that are pivoted to a bracket which is secured to the rear of the transmission housing. Standard truck and bus transmissions are designed to receive this brake. The new design is more compact than the old one, and therefore gives ample clearance for power takeoffs.

As may be seen from the side view of the brake reproduced herewith, the two single-armed levers on which the brake shoes are carried are connected at their lower ends by a pull rod surrounded by a coiled spring. The lever C, through which the brake is applied, has pivotal connections with the lower end of the forward brake-shoe carrying lever and the head of the pull rod connecting the two levers. It is claimed that the leverage has been so worked out that there is practically no end thrust on the brake disk when the brake is applied.

To adjust the brake, the nut *A* is tightened so that spring *B* exerts enough pressure to bring lever *C* solidly against lever arm *D*. A 1/16-in. shim is then inserted between the front-shoe lining and the disk, and the pull-rod is adjusted to maintain this clearance, the hand lever being in the full-release position. Nut *A* is now tightened so that there is a clearance of 1/16 in. between the rear lining and the disk. The tension spring *E* being in place, the equalizing screws *F* are adjusted until the linings are parallel with the disk, and the shims are then removed.

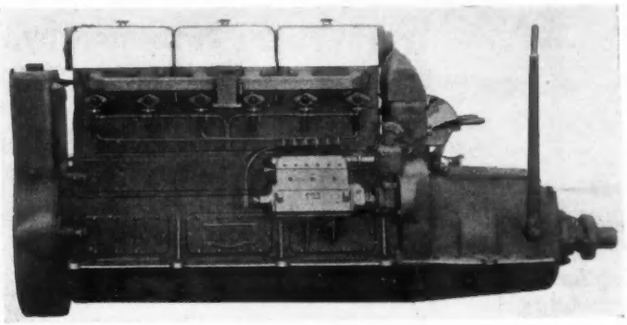
Relining of these brakes is a simple operation, since the shoes can be removed after removing spring *E*, nut *A* and shoe pins *H*. After the relined shoes have been replaced the brake is adjusted as described in the foregoing.

In the design of these brakes the material problems in connection with the different parts were carefully studied. The disks are made of high-carbon drop-forgings riveted to malleable iron centers. Shoes are made of malleable iron, levers are heat-treated drop-forgings, and the anchor pins and shoe pins are case-hardened.



Showing mechanism of new Tru-Stop brake

Buda Marine Diesel Develops 125 Hp.



Buda marine Diesel engine with reversing gear

A NEW six-cylinder Diesel marine engine rated 104 hp. at 1200, and 125 hp. at 1500 r.p.m. was exhibited at the motorboat show in New York by the Buda Co., Harvey, Ill. The engine has a bore of 5¼ and a stroke of 7 in., and develops a b.m.e.p. of 75 lb. per sq. in.

The cylinder block is cast of nichrome iron, heavily ribbed for rigidity, and is provided with seven main bearings for the crankshaft. There are three inspection holes in the crankcase on each side for easy access to the main and connecting-rod bearings, and there is also an opening in the waterjacket on the intake side for cleaning purposes. Removable covers on the pushrod side permit ready inspection of the valve roller plugs and pushrods. Cylinder liners of nichrome iron are inserted in the block. The oil pan, which runs the whole length of the engine, is an iron casting. Cylinder heads are cast in pairs, of nichrome iron, and have the latest form of M.A.N. combustion chamber. Each head is secured to the block by nine studs. Provision is made in the head for connecting an indicator, a safety valve, or a pyrometer to each cylinder. Aluminum cylinder head covers, held in place by a knurled screw each, form an oil-tight inclosure for the valve mechanism.

Pistons are of aluminum alloy, with five rings and with bearings for the piston pin in the piston bosses. The crankshaft is of 3½-in. diameter and is supported in seven steel-back, babbitt-lined bearings. It is drilled for pressure lubrication. The main bearings are of the interchangeable type and can be replaced without hand scraping. Both the intake and the exhaust valves are located in the cylinder head and are made of silchrome steel. The camshaft is supported in seven bronze-bushed bearings and is pressure-lubricated. It is driven through steel gears cut with helical teeth.

The water pump provided with the engine is of special design, having pump gears of bronze which do not touch each other, since the two shafts are geared together by steel gears inclosed in a housing filled with oil. This prevents wear of the pump gears due to impurities in the water.

The oil pump is of triplex type, combining the functions of a scavenging and pressure pump. This unit also includes the fuel transfer pump. Both pumps are accessible from the outside. Engine starting is by an electric starter driving to the inclosed flywheel and operating on 32-volt current. A 32-volt generator of the voltage-regulated type is fitted.

Lubrication is by force feed, and the dry-sump system is employed. Oil is taken by the scavenging pump from the sump through a screen, and forced through the oil cooler to the oil storage tank, which is located over the flywheel housing. From the storage tank the oil passes to the pressure pump through another cooler, and from the pressure pump it passes through a disk-edge type filter to the main oil passage, which is rifle drilled the whole length of the crankcase. Lubricating oil is delivered under pressure to all main and crankpin bearings, the camshaft bearings, to the reverse and timing gear housings, and to the rocker arms. Both the lubricating oil and the fuel oil are filtered through disk-edge filtering elements which can be cleaned while the engine is running, and a special micro-filter is connected to the fuel pump to prevent abrasive matter from getting into it.

The cooling system is of the two-current type, one current of cold water cooling the cylinder walls, while a second current is passed first through the jacket of the exhaust manifold, where its temperature is raised, and then through the jacket of the cylinder head. This prevents cold water from coming in contact with the walls of the cylinder head exposed to the heat of the burning gases, thereby preventing any danger of cracking the cylinder head casting.

Injection is by a multiple-unit pump, with constant piston stroke, the cut-off being automatically controlled by the governor. Fuel is injected into the combustion chambers through pin-type nozzles of the closed type, which are secured into the cylinder walls horizontally. The spray from these nozzles does not strike either the piston or the cylinder walls. A governor of the fly-ball type is provided.

An auxiliary compression starting valve is built into the cylinder head to be used to raise the compression. This valve serves to facilitate immediate starting, and is controlled manually from the bridge deck or engine room.

The weight of the engine is 2900 lb., which is equivalent to 23.2 lb. per horsepower.

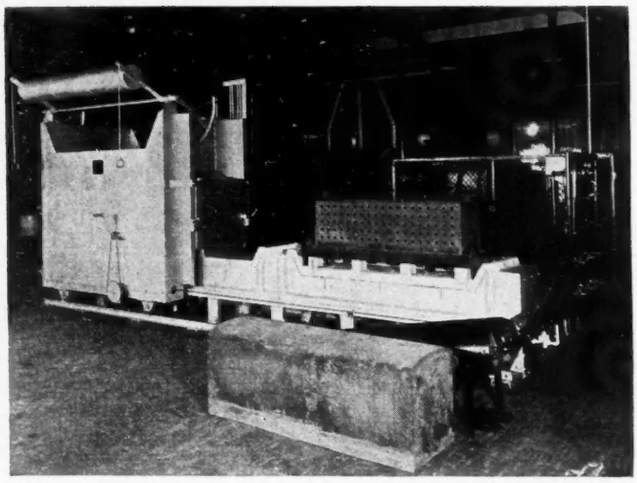


Fig. 1—Semi-continuous nitriding furnace with top of one of the containers removed to show inner construction

Nitriding for Small

by R. R. Lapelle

Furnace Engineer,
The Electric Furnace Co.

SINCE the Krupp nitriding process was first widely publicized in the United States, approximately two years, it has been the subject of innumerable articles and a large amount of experimental work. Until recently, however, no practical low cost nitriding furnace equipment had been developed. Numerous small laboratory type furnaces had been put upon the market and successfully operated for experimental use, but without exception these furnaces were of types unsuitable for commercial production of any considerable quantities of work in the doing of which the cost items must be held to a low value.

For this reason, interest has been widespread in a new type of nitriding furnace recently developed by the Electric Furnace Co., Salem, Ohio, and licensed by the Nitralloy Corp., New York, which is installed in the plant of the Commercial Steel Treating Corp., Detroit. This installation marks a long advance step in the development of nitriding equipment. It is of a type which might be termed semi-continuous in principle because even on limited production this equipment secured many of the advantages with respect to cost which may be obtained in continuous equipment. In essence, the furnace consists of a movable furnace chamber mounted upon track wheels and located above a stationary hearth. The stationary hearth, which is twice the length of the furnace chamber proper, has mounted upon it two nitriding retorts, over either one of which the furnace proper may be placed at the will of the operator.

The furnace proper consists of a structural steel shell lined with refractories and heavily insulated and provided with heavy, rugged, cast heating elements located upon the side walls of the furnace chamber. Power is carried to these heating elements by means of flexible connectors or cables mounted above the furnace. A hand-operated crank is provided by which the furnace operator may very readily move the furnace chamber back and forth over either of the furnace pots at will. This arrangement is clearly illustrated in Fig. 1.

The arrangement of a stationary hearth used in conjunction with a movable furnace has numerous advantages over the usual type of equipment, which may be summarized as follows:

1. The use of the stationary hearth permits a rigid and fixed mounting of the nitriding containers and permits the use of the permanent pipe connections from the ammonia tanks to the containers. The advantage of this arrangement lies in the fact that, since all connections are fixed and permanent, there is no danger of the ammonia supply being cut off.

2. The use of a stationary hearth and fixed ammonia connections makes it possible to use the spent ammonia from the pot undergoing heating for maintaining an atmosphere in the second pot during the cooling cycle and for purging after recharging.

3. The use of a movable furnace together with a stationary hearth makes it possible to save the amount of heat energy stored up in the furnace lining.

4. The use of retorts which do not themselves contain the heating elements tends to lower the rate of dissociation which is obtained inside the pots.

5. The use of the arrangement described above makes it possible to eliminate the considerable risk to workmen and equipment involved in handling the hot retorts into and out of the furnace chamber as is done with some older designs of nitriding furnaces.

6. The use of the stationary hearth in conjunction with a movable furnace makes possible the use of circulating fans in the bottom of each container. These fans, together with a proper distribution of the heating elements within the furnace, result in a highly uniform temperature distribution throughout the charging area.

A Temperature Survey

A temperature survey made in a recent installation, utilizing five check couples in conjunction with one control couple, indicated a maximum temperature differential during the soaking period of only 5 deg. F. See Fig. 2. Such uniformity of temperature is conducive to the highest quality of work and insures a uniform case depth throughout the charge. The use of the fan has a second advantage in that by bringing fresh supplies of ammonia constantly to the parts being treated it insures the

Production Obtained at Low Expense

Furnace installed by Electric Furnace Co., at Detroit Commercial Steel Treating plant, gives cost benefits of continuous output on semi-continuous schedules

greatest possible rapidity and uniformity in the development of the nitrided case.

Because of the location of the fans underneath a stationary hearth, the drive motors and bearings are readily accessible at all times, and therefore it is easy to insure their receiving the proper attention, thus insuring trouble-free operation.

The installation at the Commercial Steel Treating Co. has a number of other interesting features. Among these is the elimination of the usual molten metal seal used for closing the retorts. In place of the molten metal or of the equally undesirable bolted and gasketed joint, a special dry powdered sealing material is utilized to prevent infiltration of air or loss of the ammonia gases. With this sealing material it is possible to hold a pressure within the retorts of more than 4 in. of water without appreciable leakage.

Pots of Special Analysis Steel

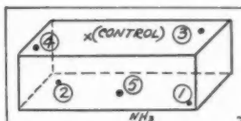
The pots used in this installation are made of special analysis steel finished with a vitreous enamel developed especially for nitriding use. This enamel has the property of retaining its elasticity at all temperatures so well that it does not crack or chip off the container during the heating and cooling cycles or during the normal handling of the boxes during loading and unloading.

Pots covered with this enamel are unaffected by the nitriding gases even after relatively long exposure, and do not adversely affect the dissociation rate. The initial dissociation rate in such enameled pots is considerably lower than that obtained initially in pots made of any other known material, not excluding the very expensive alloys formerly used for this purpose. Because of these factors, the work has proved so markedly superior both in case hardness and economy of ammonia consumption that these retorts bid fair to replace all others for this use.

The installation in Detroit has been designated by the Nitralloy Corp. as a nitriding center for experimental purposes. To provide maximum flexibility, this furnace is equipped with one large container and two smaller containers so that work of varying characteristics can be loaded at the same time.

The temperature control panel is equipped with Wilson-Maeulen indicating and recording temperature control instruments. An ammonia control panel is equipped with tank pressure and flow gages, back pressure gage, bubble jars, dissociation pipette, etc., as well as a number of four-way valves visible at the bottom of the panel. These valves are so arranged that the operator is able to direct the flow of ammonia to any one of the three pots and thence through any other pot or pots in series, as may be desired.

A similar furnace installed in a Midwest plant has been in operation for over nine months. This installation turns out approximately 710 lb. of material every two days, obtaining a case depth of from .015 in. to .018 in. and a hardness of 1000 Vickers-Brinell. In this installation the entire cost of operation, including power, ammonia, labor and all other items, is well under two cents per pound.



SCLERESCOPE HARDNESS
8 READINGS PER BALL - LOWEST READING

	100	105
TOP-100	54	46
CENTER-100	51	49
BOTT-100	47	53
	152	148

DATE	TIME	NH₃ CU.FT. PER HR.	%	THERMOCOUPLE-DEGREES FAHR. ①	②	③	④	⑤	CONTROL
4/7/31 P.M.	5:30	15	100	PURGING WITH SPENT GAS					
	6:15	"	30						
	6:30	"	POWER ON 8	70	70	70	70	70	70
	7:00	"	30	750	750	820	805	805	820
	7:30	"	30	890	865	930	905	910	900
	8:30	"	30	920	915	930	920	920	910
	9:00	"	27	950	950	960	950	965	945
4/8/31 A.M.	12:30	"	32	955	955	960	955	960	960
	1:30	"	30	960	960	960	955	965	960
	2:30	"	31	960	960	960	960	960	955
	4:00	"	29	965	965	965	955	960	960
	5:30	"	29	955	950	965	955	960	960
	9:00	"	28	965	965	965	960	960	960
	11:50	"	29	960	960	960	960	960	960
4/8/31 P.M.	1:20	"	30	960	960	960	960	960	960
	3:00	"	29	960	960	960	960	960	960
	4:45	"	29	962	962	962	965	960	960
	7:15	"	29	960	960	960	960	960	960
	8:45	"	28	965	960	965	955	960	960
	9:45	"	28	970	960	970	960	960	960
	11:00	"	27	970	960	970	960	960	960
	12:00	"	27	970	960	970	960	960	960
4/9/31 A.M.	1:00	"	27	965	960	960	960	960	965
	2:00	"	28	970	960	970	960	960	960
	3:00	"	28	970	960	970	960	960	960
	4:00	"	27	970	960	970	960	960	960
	5:00	"	28	970	960	975	960	960	965
	6:00	"	29	970	960	970	960	960	960
	7:00	"	28	965	960	965	960	960	965
	8:00	"	28	960	960	960	965	960	960
4/9/31 P.M.	12:30	"	28	960	960	960	960	960	960
	3:00	"	28	960	960	960	960	960	960
	6:30	"	POWER OFF 28	960	960	960	960	960	960

Fig. 2—Test log of temperature study with one control couple and five check couples. Maximum temperature differential during soaking period was only 5 deg. Fahr. Charge consisted of 300 hollow walls 2½ in. diameter weighing 2 lb. 6 oz. each

U.S. Analyzes World Replacement Needs

"Foreign Markets for Automotive Replacements, Accessories and Service Station Equipment," just released by the Automotive Division, Department of Commerce, says that the next 10 years will bring a vast demand abroad for such U. S. products.

It is evident that competition for this business will be keen, as foreign manufacturers are beginning to gain a foothold in this type of equipment.

More careful foreign market analysis, judicious distribution policies and better adaptation to export demands of individual markets will be more essential than ever to successfully meet this competition.

American ingenuity and reputation for quality are challenged by the changes in the world automotive picture.

DOWN on the barren tip of South America a modest service station takes care of the few automobiles which have penetrated to this fringe of civilization. Thousands of miles away in frigid north Finland is another.

These two remote outposts of the world's automotive trade symbolize a remarkable commercial development which has flung around the world a vast girdle of shops and garages to sell "service" to nearly 36,000,000 automobile owners.

The business of equipping and repairing more than 8,000,000 automobiles owned outside the United States has created a new type of commercial activity abroad and a new field of opportunity for our own manufacturers. The extent to which the world trade in automotive equipment has developed in the last decade is described in a new survey of foreign markets for this equipment, which has just been released by the Automotive Division of the Department of Commerce.

This study, which includes reports of personal investigations of conditions in more than 100 different foreign markets, remarks that exports from the United States of replacement parts, accessories, and garage and service station equipment amounted to $61,026,994 in 1930, or 20 per cent of our total automotive exports during that year. The 1930 total was more than $29,000,000 in excess of shipments in 1924, the earliest period in which a separate record of these exports was kept.

The average annual value of these equipment exports since 1924, when the total was $31,627,000, has amounted to $60,428,000.

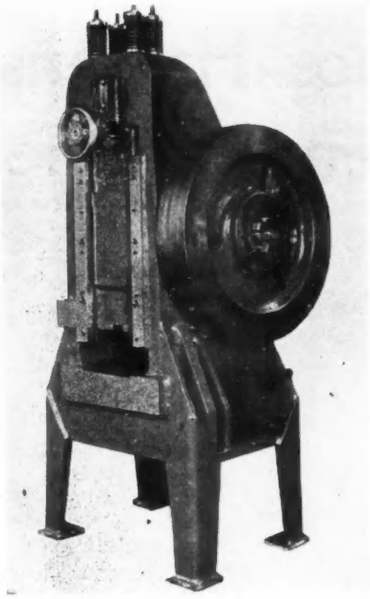
This survey of the world as a vast market for American automotive equipment discloses an important and steadily expanding potential demand for replacement parts; a generally waning demand for certain types of accessories but reassuring evidences of opportunities for other types, and an exceedingly promising outlook for sales of service appliances. As the reports on the separate foreign markets are studied it becomes clearly evident that increasing industrialization of many countries has stimulated local manufacturers of certain types of equipment which formerly were largely imported from the United States.

Credit policies of foreign manufacturers have exercised a definite influence upon the trade. As the motorization of foreign countries has increased, local preferences have crystallized or altered with a consequent shift in the trends of demand. Distribution problems and practices have developed which require the most careful attention by the exporter. Regulations have been enacted which restrict or alter the demand for certain types of equipment.

Prompt and efficient service is, in many instances, of even greater importance to the foreign operator of an automobile than to the American owner because of the unfavorable operating conditions which still exist in a great many of the foreign countries.

Consequently, the past few years have witnessed a growing recognition of the need of servicing accommodations abroad, and increasing purchases, not only of replacement parts but also of equipment used in service operations. The predominance of American cars abroad, the quality of American equipment and the recognized leadership of the United States in the development of service equipment and practices have enabled our products to become strongly entrenched in most foreign markets.

Improved conditions and the recovery of foreign buying power will unquestionably release the accumulated demands for service which, with the normal requirements resulting from the sales of new automobiles abroad, should hold a reassuring promise of further expansion in our export trade, the survey indicates.



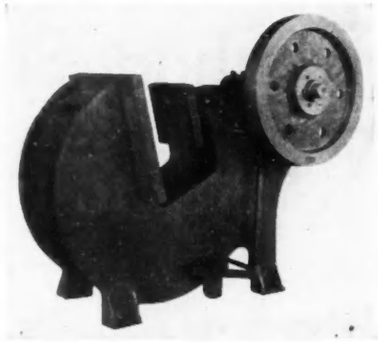


Fig. 1. 200-ton knuckle joint press in solid frame construction to minimize right to left dimensions

Fig. 2. Welded construction achieves flexibility as evidenced by this inclinable press. It was built to suit specific conditions

Fig. 3. H & W also builds welded steel frames to replace broken cast iron units. This one is for a 55-ton press and is made interchangeable

Henry & Wright Line of Welded-Steel Presses Extended to Cover More Types

EXTENSIVE additions have been made to the line of steel presses of welded construction in the inclinable and single crank, straight-sided types introduced several months ago by The Henry & Wright Mfg. Co., Hartford, Conn. These additions include a series of double crank straight-sided presses, Horning types, straight-sided knuckle joint presses, double crank overhanging gap frame presses, as well as special presses of various types.

Practically all of the single crank, double crank and knuckle joint presses are made in the shrunk-in, tie-rod construction, although a number of these presses have been built with solid frames where special tooling or other conditions warranted same.

In either type of construction, the frame members, as well as the slide and large gears, are made from welded steel units carefully annealed and normalized before any machining is performed in order to release any stresses set up in either the rolling or welding processes. This eliminates the possibility of distortion from these stresses after the machines have been placed in operation.

All welded units are made from steel plates of special welding quality and are arc welded with the highest grade of covered wire with particular attention paid to heat control.

The 200-ton capacity knuckle joint press illustrated in Fig. 1 is one of a battery made in the solid frame type in order to keep the right to left overall dimension to a minimum for the required die space.

In addition to the frame, the slide and wedge block are also made from fabricated steel units to obtain the maximum rigidity for the specially intricate coining operation which the presses must perform.

The design of the slide and link mechanism is such that a length of guide ways is obtained on the slide approximately 50 per cent longer than is customary on a press of this capacity without increasing the overall height of the press.

This machine has a ½-in. stroke and operates at 65 strokes per minute. Adjustment of the slide of ½ in. by means of a wedge is provided. Continuous force feed lubrication is applied to the hardened and ground alloy steel pins and link linings from a pump and oil reservoir located at the rear of the press. Finished pads are furnished on the frame so that the user can mount special feeds previously used on cast-iron frame presses for this work.

Another example of the flexibility of welded steel construction in providing a press to exactly fit special tool requirements of the customer is shown by the fixed inclined open back press in Fig. 2. This machine is inclined 15 deg. from the horizontal and has an especially large bed area and opening for the capacity of the press. Although this machine is lighter in weight than a cast-iron press of corresponding crankshaft diameter, an increase of over 30 per cent in die life was obtained on the battery of steel presses.

This company is also furnishing welded steel frames for all types of presses to replace broken cast-iron frames. One of these steel frames is shown in Fig. 3 and replaces a cast-iron frame for a 55-ton press which had broken around the horn hole. The steel frames are machined to use the shaft, slide and all other parts of the old presses.

Double-Duro Method Surface-Hardens Crankshafts With Acetylene Flame

Process interposed between rough-grinding and finishing operations on journals results in hardness of 600-700 Brinell, with penetration of 3/32 to 1/4 in.

A NOVEL method of surface hardening the journals of crankshafts was described by Dr.-Ing. Guido Prachtl in a recent issue of Automobiltechnische Zeitschrift. It is known as the Double-Duro process and was developed by the Bergische Steel Works. When applied to automobile crankshafts a special steel is used containing 0.45 carbon, 0.05-0.60 manganese, 1.00 chromium, 0.25 molybdenum, and 0.25 silicon. When this steel is treated by the Double-Duro process it attains a hardness of 80-90 Shore, or 600-700 Brinell, which corresponds to a tensile strength of 315,000-340,000 lb. per sq. in.

The process consists in progressive local heating and immediate quenching, so that a continuous band of hardened surface results. The crankshaft is drop-forged in the usual way, quenched in oil from a temperature of 1475 deg. Fahr., and reheated to 1165 deg. Fahr., which treatment gives it a tensile strength of 114,000-142,000 lb. per sq. in. Machine operations on the crankshaft are the usual ones, but the hardening process is interposed between the rough grinding and finish grinding on the journals.

The Equipment Required

The equipment required for the process includes a hydraulic, high-pressure acetylene generator, furnishing acetylene gas under 12 to 13 lb. per sq. in. pressure. This gas is mixed with oxygen in a burner developed through a long series of experiments. The burner produces a broad flame of white color, 1/4 to 5/16 in. long, and rounded at the corners. The width of the flame is so adjusted that it is from 1/4 to 1/2 in. less than the width of the crankpin or main journal to be hardened. The reason for this is that the hardened layer should merge gradually into the unhardened crank arm so the elasticity of the metal at the junction will not be impaired.

The penetration varies from 3/32 to 1/4 in., depending upon the speed at which the crank is being turned while subjected to the flame, as well as upon the distance of the flame from the journal, that is, upon the heating effect. There is a gradual transition from the outer hardened layer to the core.

In metallurgical terms, the hardening process consists in the transformation of sorbite via austenite into martensite, and this necessitates raising the surface rapidly to a definite high temperature, which must be followed by quenching at a critical rate. In the case of an ordinary carbon steel containing 45 points carbon the upper transformation point is about 1475 deg. The chromium content lowers the transformation temperature to 1340 deg. Hence the transformation of austenite into martensite is rather complete, especially in the surface layer. Below the surface the martensite is mixed more and more with sorbite, until the purely sorbitic core is reached, which was produced by the heat treatment. After quenching the core gives off heat to the surface layer and thus produces a reheating effect. The hardened layer does not show any enrichment in carbon, as in case hardening, but only dissolved carbon, so-called hardening carbon in solid solution; that is, carbon which did not have sufficient time to be converted into iron carbide. Quenching lowers the lower point of transformation from 1275 deg. to 575 deg.

The hardness depends upon the carbon content in conjunction with the chromium content. The aim now is to increase the carbon content as much as possible, because this permits lowering the annealing temperature, giving a purely martensitic structure with maximum hardness. A carbon content of 0.45 per cent has been reached already.

The hardening process is as follows: To begin with, the burner is so arranged that the flame is radial to the crankpin and the white flame is about 1/8 in. from the pin. This results in heating the initial strip of the pin surface to 1435-1475 deg. When this temperature has been reached—as shown by the color—the rotating mechanism is quickly engaged and the pin is heated continuously, and immediately quenched. When the rotation is completed there is an overlapping of the beginning and the end. This overlapping gives a very narrow softer strip. which is placed at a point of the circumference where resistance to wear is of less importance.

Immediately below the hardening flame there are two quenching nozzles, which quench with water at 105-125 deg. Fahr. The second, lower quenching nozzle serves as a water dam, permitting of bringing the level of the cooling water as close as possible (about 3/8 in.) to the flame, in order that the rate of cooling and therefore the hardness obtained may be maximum. At present, experiments are being made with solutions of table salt with the object of increasing the rate of cooling.

After all of the journals have been hardened in this way the crankshaft is annealed in an oil bath

or an electric oven for two hours at 320-356 deg. Fahr., to remove possible hardening strains. If any distortion should have taken place which cannot be removed by the finish grinding, the crankshaft is first straightened.

Then the main bearing journals are rough ground, and next the crankpins are finish ground. If, during the grinding process, the crankshaft should have distorted, the slight run out can be removed by the following finish grinding of the main journals.

The process has been applied also to gears, such as starter gears and camshaft gears for automobile engines. In that case a steel with less carbon and practically no alloy content is used, and while the surface hardness obtained is not as high with the 0.45 carbon chrome-molybdenum steel, a tensile strength of 177,000 lb. per sq. in. can be obtained with this alloy.

Vibration Records Check Machine Tool Conduct

Fig. 1—Type of vibration recorder used in Schrader plant

THE plant of A. Schrader's Son, Brooklyn, N. Y., has an interesting application of vibration recorders set up to secure operating data on machine tools. Although the use of vibration recorders for this purpose is not new, it is significant to find a large manufacturer using them as an important tool in production-planning and time study.

The recorder shown in Fig. 1 is typical of the instruments on the market. It consists essentially of a pendulum with a stylus at one end which scribes on a circular chart. The unit is mounted as shown on a pivoted arm above some rotating member on the machine that will impart a vibratory motion when in operation. In the Schrader plant recorders have been mounted on special automatics, turret lathes, screw machines, punch presses, and the like.

Vibration impulses, continuous or intermittent, are recorded automatically on a chart which finds its way at the end of the day to a board (Fig. 2) in the time-study department for detailed analysis. This chart shows clearly the following important elements of machine operation:

1. Starting time at the beginning of the shift and the time it is shut down at the end of the shift.
2. The time and duration of any interruption of operation during the working hours.
3. The presence of any periodic shutdown that might be avoided by resetting tools at specified intervals.
4. A graphic comparison between the performance of similar machines or operators, or methods of tooling, speeds and feeds.

In practice a new chart is placed daily on each recording device. The date, number of the machine, number of the operator, and the part number of the piece being made are noted. At the end of the day the number of pieces turned out is likewise noted.

During the day the operator of each machine is required to keep a record giving the cause for any shutdown, thus checking closely with the automatic record. This log sheet, together with the chart, serves as a basis for comprehensive analysis. For example, the chart is checked with previous performance and with charts from similar machines. The experience of this company and others indicates that the record made by the machine in operation is a valuable adjunct to the usual methods of securing production data. The continuity of the data and the ease with which it may be obtained and analyzed endow this method with great possibilities. Perhaps its most important function is to save putting a time-study man on a purely routine job.

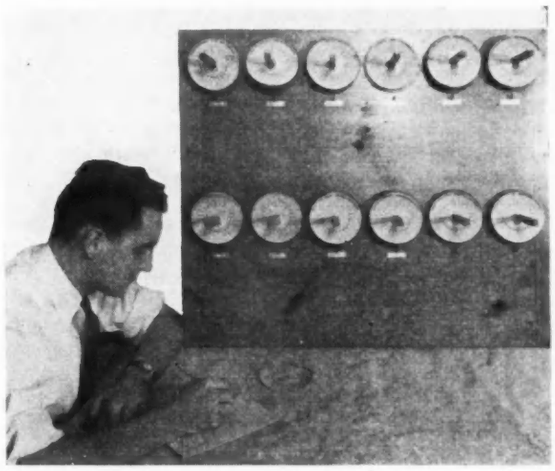
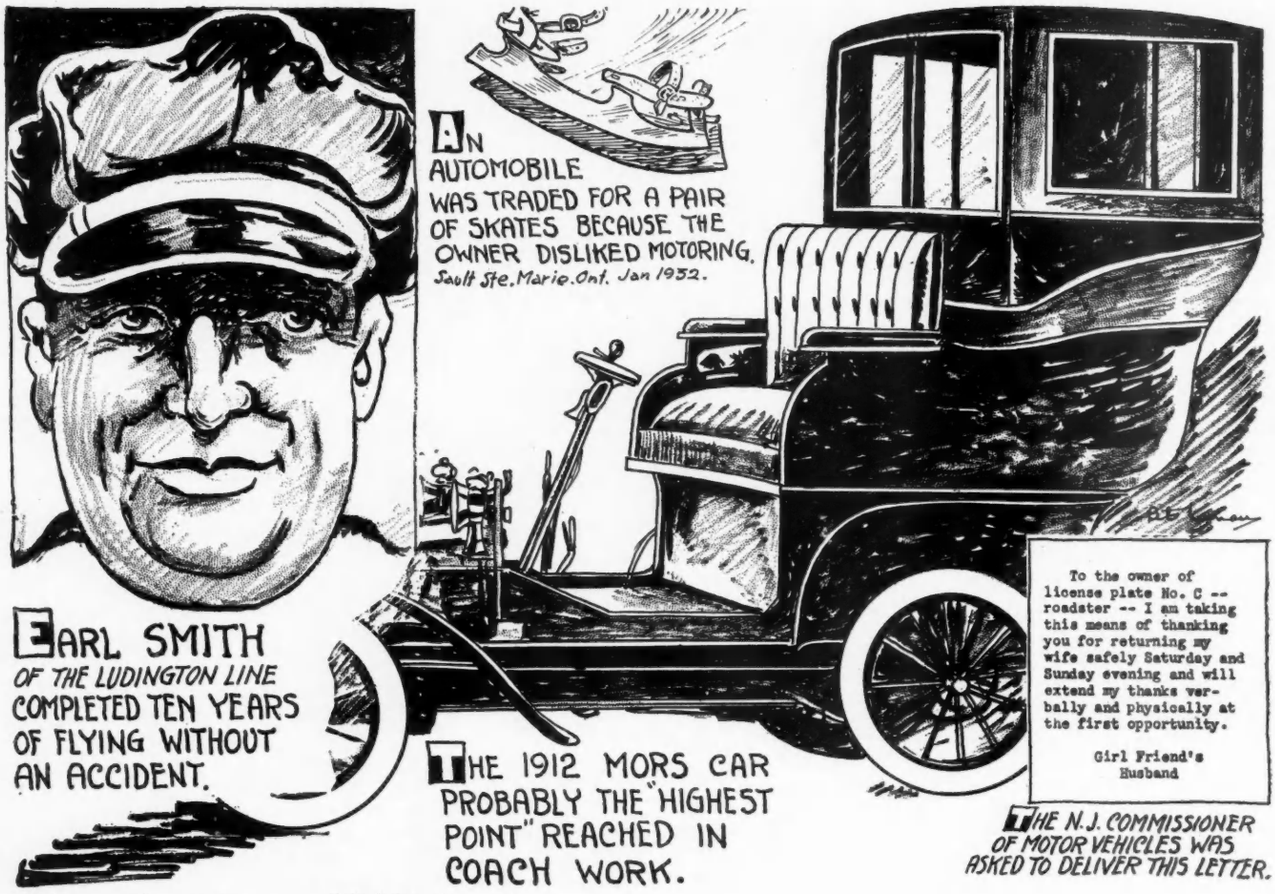


Fig. 2—Vibration records mounted on board in time-study department

Automotive Oddities—By Pete Keenan



EARL SMITH OF THE LUDINGTON LINE COMPLETED TEN YEARS OF FLYING WITHOUT AN ACCIDENT.

THE 1912 MORS CAR PROBABLY THE "HIGHEST POINT" REACHED IN COACH WORK.

THE N.J. COMMISSIONER OF MOTOR VEHICLES WAS ASKED TO DELIVER THIS LETTER.

Write us if you know an "Oddity"

The News Trailer

The "saturation point" in automobile registrations (whatever that is) is a long way off in England and Canada.

Both countries have dues-paying members in Pedestrians' Rights Association, which will work for laws against careless driving. Pay envelopes of secretaries will be getting thinner and thinner as the "car per family" goal is approached.

Archeologists and ethnologists, guests of Charles F. Kettering on an exploring trip, were treated to some high-priced monkey wrench work, when their host got busy with defective plumbing and lighting in a palm-leaf hut in Yucatan, generously called a "hotel." (We've seen plumbers who acted like leisurely millionaires, but never knew one before!)

If anything could make a trip to the wild haunts of ancient Mayans endurable, it would be so gracious and Chesterfieldian a host as Mr. Kettering.

Not only did eights break the all-time record for sales in 1931 (see page 379), but sixes led the industry in popular favor, aided and abetted by Chevrolet's brilliant performance of titling 583,387 cars during the year.

Photronic cells, which have been performing their robotism brilliantly in more progressive shops, are being used to turn on and off aircraft beacons.

When Old Sol slips down into the west, "click" and the beacons will light up and begin to revolve. At dawn, another "click" and the beacons will take a rest. Time-clocks will be obsoleted.

Constant readers of this column (if any) will recall our prediction of several months ago that automobiles might soon be wrapped in cellophane, with the spread of the custom. Something very like that happened at the Buffalo Automobile Show, where there was displayed a Lincoln completely guarded from profane hands by a covering of kodapak, which is very much like cellophane. In the flush of our success as a prophet we are hereby extending our prediction to cover airplanes and battleships.—L.P.

NEWS

International Newsreel photo

Barney Oldfield, one of America's first automobile speed drivers, congratulating Sir Malcolm Campbell, British sportsman, after the latter had set a new world's speed mark of 253 m.p.h. in his renovated "Blue Bird" car

Huge Tax Savings To Motorists Seen

General Manufacturers' Levy Substitued for Car and Gas Tax in House Committee

WASHINGTON, March 3—The decision of the House Committee on Ways and Means to reject the Treasury Department's recommendation for excise taxes on the motor industry, and to adopt a general 2 per cent tax on manufacturers' sales instead, will mean a saving estimated at $33,337,600 for the industry.

Elimination of the proposed 1 cent per gallon tax on gasoline will mean a saving estimated at $130,600,000. Put together, the aggregate saving is $163,937,600 to the motorists of the country since the excise taxes would have been paid by them.

Based on the 1931 motor production it was estimated that the possible excise revenue under the proposed Treasury levies would have been $75,357,600. The American Automobile Association, using the same basis of production, estimates the 2 per cent tax will be $42,020,000.

The 1 cent Federal tax proposed on gasoline was estimated to raise $165,000,000. The association estimates that a 2 per cent tax will raise $35,400,000. This is based on the consumption of 15,000,000,000 gallons at an average wholesale tank wagon price of 11.80 cents per gallon.

It estimates a 2 per cent tax on lubricating oil will raise $4,152,000, using an estimated consumption of 1,730,000,000 qt. Under its calculation total 2 per cent taxes from motor vehicles, accessories and tires, gasoline and lubricating oil will be $81,572,000.

This is matched against the Treasury's scheme of selective sales taxes, now discarded, under which motorists would have paid $240,357,000, or nearly 20 per cent of the new revenue.

The Ways and Means program, which promises to get through the House with little or no change of importance, would reduce the motorists' share of taxation to less than 7 per cent of the total.

The decision of the Ways and Means Committee to eliminate the Treasury's recommended taxes on the motor industry has naturally been a source of gratification to it. Its strong presentation against the taxes was seen from the outset as a moving power

(Turn to page 400, please)

Federal Control Of Trucks Hit

T. R. Dahl, N.A.C.C. Spokesman, Vigorously Protests Proposed Law

WASHINGTON, March 3—Vigorous opposition to Federal regulation of motor trucks was made in oral arguments before the entire Interstate Commerce Commission on Tuesday and Wednesday of this week by representatives of the industry while railroad interests urged Federal regulation of both motor bus and motor truck operations.

The arguments were made in connection with the report of Examiner Leo J. Flynn on rail and motor coordination. While there were varying opinions as to the methods of regulating motor buses, neither the producers nor operators were opposed to a system of regulation.

Speaking as a member of the Truck

(Turn to page 400, please)

Commercial Credit Dividends

BALTIMORE, MD., Feb. 25—At the regular meeting of the board of directors held here today, regular quarterly dividends on Commercial Credit Co. 6½ per cent and 7 per cent first preferred stocks, 8 per cent Class B preferred and the $3 Class A convertible stocks were declared, payable March 31, to stockholders of record at the close of business March 11.

DeSoto Deliveries Up

DETROIT, March 1—Retail deliveries reported by De Soto dealers for the first two weeks of February show a gain of 31½ per cent over the same period last year, a 69½ per cent gain during the third week and a 75 per cent gain for the fourth week.

Eddins Elected Olds President

General Manager Since 1929 Promoted by General Motors Corp.

DETROIT, March 1—D. S. Eddins, general manager, Olds Motor Works, has been elected president, according to announcement by Alfred P. Sloan, Jr., president, General Motors Corp. Mr. Eddins will continue as general manager of the company.

Joining the automobile industry in 1908 by entering the shop service, he has been connected with Buick as retail dealer, later selling out and joining Studebaker Corp., where he continued until 1913, when he joined the sales organization of Maxwell Motor Co. For three years he represented this concern in various sections of the country, and in 1916 took over the distributorship in Denver.

Two years later he disposed of this business to join Chevrolet Motor Co., opening its Denver branch in 1918, continuing with Chevrolet for more than six years.

He then was appointed assistant general sales manager, holding that position until his appointment as general sales manager of Oldsmobile, June 1, 1925. He was appointed general manager in 1929.

Checker Shows Profit

NEW YORK, March 2—Checker Cab Co. and subsidiaries report net profit for 1931 of $431,168. This is equivalent to 99 cents a share on outstanding stock. The corporation has elected Raymond Ellis and Charles Hartman to the board of directors.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, March 1—Improved business sentiment is apparent in many quarters, although it has not been accompanied as yet by any tangible change in the rate of business activity. The better feeling is attributed to the natural reaction from the overdrawn pessimism and the decisive measures taken by the Government to strengthen the financial situation.

GUARANTY INDEX LOWER

The Guaranty Trust Co.'s index of business activity for January stands at 55.9, as against 58.8 for the preceding month and 72.4 a year ago. The company's index of wholesale commodity prices on February 15 was 41.4, as against 43.1 a month earlier and 53.4 a year earlier.

CAR LOADINGS FEWER

Railway freight loadings during the week ended February 13 totaled 562,465 cars, which marks decreases of 12,291 cars below those during the preceding week, of 158,224 cars below those a year ago, and of 330,675 cars below those two years ago.

EMPLOYMENT DOWN

The level of employment during January, according to the Department of Labor, declined 3.9 per cent below that in December and payrolls decreased 7.5 per cent.

FAILURES HIGHER

Commercial failures during January, according to the R. G. Dun & Co., totaled 3458, a new high record, as against 3316 a year ago. The liabilities involved in the January failures aggregated $96,860,000, also a new high record, as against $94,608,000.

SPINDLES IDLE

There were 32,289,800 cotton spinning spindles in place in the United States on January 31, of which 25,013,750 were operated at some time during that month, as against 24,637,864 during December and 25,628,284 a year ago.

Average daily crude oil production for the week ended February 20 amounted to 2,108,050 barrels, as against 2,138,300 barrels for the preceding week and 2,165,250 barrels for a year ago.

INDEX HOLDING OWN

Professor Fisher's index of wholesale commodity prices for the week ended February 27 stood at 63.7, as against 63.7 the week before and 63.6 two weeks before.

STOCK MARKET WEAK

The stock market last week showed a weakening tendency on a relatively small volume of business. The market showed little response to the reduction of the rediscount rate of the Federal Reserve Bank of New York from 3½ to 3 per cent. and the passage of the bill to extend the credit facilities of the Federal Reserve banks. The controlling factors appeared to be the poor showing of railway earnings for January and the absence of any definite signs of an upturn in business.

RESERVE RATIO UP

The consolidated statement of the Federal Reserve banks for the week ended February 24 showed decreases of $11,000,000 in holdings of discounted bills and of $13,000,000 in holdings of bills bought in the open market. Holdings of Government securities remained unchanged. The reserve ratio on February 24 stood at 68.0 per cent, as against 67.4 per cent a week earlier and 67.6 per cent two weeks earlier.

Chrysler Shows Gain in 1931

Registrations Increase Although Total Industry Sold Less

DETROIT, Feb. 29—1931 registrations of Chrysler Motors cars throughout the United States were 1.7 per cent over the 1930 sales, according to B. E. Hutchinson, vice-president and treasurer of the corporation. This compares with 27.3 per cent less for the entire industry.

An increase of 12 per cent in total registrations for the industry was obtained by Chrysler Motors cars. This was 3.5 per cent more than its share in 1930, it is stated. Although registrations of the new Plymouth cars were 46.6 per cent more than 1930, Chrysler, Dodge and DeSoto were well above the average of the industry, and each obtained a larger percentage of total registrations than in the previous year.

McQuay-Norris Co. Builds in Canada

$500,000 Parts Plant Under Way at Toronto

TORONTO, Mar. 3—McQuay-Norris Mfg. Co., St. Louis, has purchased four acres of ground near here for a $500,000 plant. Work has started on the first $60,000 building of six factory units.

Nelson A. Hardie, Toronto, the company's Canadian representative, will be manager of the McQuay-Norris plant.

Norwalk Tire on Board

NEW YORK, Feb. 29—Norwalk Tire & Rubber Co. has secured listing on the New York Stock Exchange of 10,546 shares of 7 per cent cumulative preferred stock at par value of $50, and 202,730 shares of common stock with no par value. This stock is being issued to replace old stock now outstanding. The exchange will be made on the basis of one share of new preferred stock and 5 shares of new common stock for each share of preferred stock of $100 par value outstanding, and one share of new common stock per share of old common stock of $10 par value now outstanding.

Buick Deliveries Up

DETROIT, Feb. 29—Buick Motor Co., has reported an increase of 32.6 per cent in the number of retail deliveries of Buick cars for the second ten days of February over the first ten days of the month.

The deliveries were: First ten days, 1334; second ten days, 1771. The figures include all models and price groups.

According to the latest complete registration figures for the United States, Buick registered six times as many cars as its nearest competitor in the eight-cylinder field.

Legislators Busy On Restrictions

Survey Shows Many States Undertaking to Further Restrict Vehicles

NEW YORK, March 1—Recent bills introduced into the various state legislatures now meeting, include a number of additional bills affecting the automotive industry.

Increased taxation in various forms is noticeable in a number of states, Mississippi proposing an increased mileage tax; New Jersey an excise tax on trucks for hire; New Jersey, North Carolina and South Carolina increased registration fees; New York an income tax on trucks; Kentucky, New York and Virginia increased gasoline and oil taxes, and Mississippi, Virginia and New Jersey proposing further diversion of tax funds from road use.

Further regulation of commercial vehicles is proposed in Mississippi, New Jersey, New York and Virginia; further weight limitations are proposed in Mississippi and further size limitations in Kentucky and South Carolina. Proposals for changing financial responsibility laws are made in Kentucky, New York and Virginia.

Periodic inspections are proposed in Mississippi and Rhode Island. Mississippi and Virginia would curtail non-resident privileges further than at present, while New Jersey would remove these restrictions from commercial vehicles, but retain them for passenger cars.

There are also a number of bills calling for miscellaneous special equipment, and a few other miscellaneous items.

Loss Is Shown By General Tire

NEW YORK, March 1—General Tire & Rubber Co. reports net profit for the year ended Nov. 30, 1931, of $262,504 before provision for special reserves. After setting aside these special reserves, the company shows a loss for the year of $444,062.

Balance sheet for the year shows current assets of $7,309,965, as compared with current liabilities of $1,454,634.

Hayes Body Co. Reports Loss

NEW YORK, March 1—Hayes Body Corp. reports net loss for 1931 of $880,299. This compares with loss for the previous year of $852,606.

Bellanca Loses $532,086

NEW YORK, March 3—Bellanca Aircraft Corp. and subsidiaries report net loss for 1931 of $532,086. This compares with loss of $324,139 for the previous year.

Men of the Industry and What They Are Doing

Mosedale Heads Geometric Territory

R. F. Mosedale has been appointed representative of the Geometric Stamping Co. in northwest Pennsylvania and western New York, operating from Buffalo. The company is a custom manufacturer of metal stampings and pressed parts, serving many leading automobile manufacturers, and operates a large modern plant in Cleveland.

Van Deventer On U.B.P. Board

J. H. Van Deventer, editor of *The Iron Age*, has been elected a member of the board of directors of United Business Publishers, Inc., of which the Chilton Class Journal Co., publishers of *Automotive Industries*, is a unit. Mr. Van Deventer has been an outstanding figure in business publications for a number of years.

Indian Elects

E. Paul du Pont and Loring F. Hosley were reelected president and treasurer, respectively, of Indian Motocycle Co. Francis E. du Pont and Mr. Hosley were reelected vice-presidents. Leslie Mason was appointed assistant treasurer to succeed John C. Cronin, who becomes manager of police sales. The board of directors is unchanged.

Peterson Is Consultant

G. S. Peterson, furnace department, the Strong, Carlisle & Hammond Co., Cleveland for the past 12 years, offers his services as industrial furnace engineer and contractor.

Vail Sails for Europe

Edgar L. Vail, vice-president, Jaeger Watch Co., Inc., sailed for Europe on Feb. 27 to study development of new designs for automotive timepieces and mirror-clock combinations.

Hardie Goes to India

E. E. Hardie has been appointed district manager for the Studebaker Pierce-Arrow Export Corp. in India. He was district manager for the corporation in Central Europe. Mr. Hardie will operate in his new territory under the direction of D. W. Smith, regional director, in charge of Studebaker and Pierce-Arrow business in the Orient.

Berry Now Heads Udylite Advertising

Edward F. Berry has been appointed advertising manager for the Udylite Process Co., Detroit. This concern is the licensor of the Udylite process of applying protective coatings of electrolytic cadmium to metal surfaces for corrosion prevention.

Edward F. Berry

Formerly with the Aluminum Co. of America as research chemist, he was editor of *Metal Cleaning and Finishing* before joining the Udylite Process Co.

G. M. Insurance Reports Gains

NEW YORK, March 3—General Exchange Insurance Co., affiliated with General Motors Acceptance Corp., reports a gain for 1931 of 12.2 per cent in premium income and a decrease of 2.3 per cent in loss ratio.

Premium income for 1931 was $11,942,325, while in 1930 it was $9,753,824. Losses paid were $6,040,859 for the year, compared with $5,128,005 for the previous year. Unearned premiums as of Dec. 31, 1931, amounted to $7,142,088, as compared with $6,049,007. Surplus was $3,845,408 for 1931, compared with $6,691,822 for the previous year. Admitted assets were $13,514,061, as compared with $15,404,962 for 1930. Capital was $1,000,000 in both years.

New Craft Designed For National Air Show

DETROIT, March 3—Newly designed Waco, Stinson, Fairchild, Kellett, Pilgrim and Nicholas-Beazley airplanes are among the new presentations to be made at the National Aircraft Show of 1932, to take place here April 2 to 10, under the auspices of the Aeronautical Chamber of Commerce of America, Inc.

Duray Rebuilding Speeder

WILLIAMSPORT, PA., March 1—Leon Duray, noted race driver, is rebuilding his two-cycle, Zoller-powered race car here at the Lycoming plant. The car started in last year's Indianapolis race, but became overheated early in the race and was withdrawn.

Orders Boost Employment

MILWAUKEE, Feb. 29—Recent orders from automobile manufacturers have enabled the Ladish Drop Forge Co. to increase production and payrolls, according to H. W. Ladish, president. The company is now employing 300 workers on a five-day week schedule.

10,000 Fight 'Leggers

OKLAHOMA CITY, March 1—Ten thousand oil workers and filling station operators have been enlisted as "detectives" in a drive to exterminate the gasoline bootlegger, under the state tax commission and the Oklahoma Petroleum Marketers Association.

Siam Boosts Tire Duty

WASHINGTON, March 3—Effective Feb. 22, Siam increased the duty on tires and tubes to 33 1/3 per cent from 10 per cent, according to a radiogram from Commercial Attache Charles E. Brookhart, Bangkok.

Seeks Walkerville Plant

TORONTO, Mar. 3—The Wel-Ever Piston Ring Co. is negotiating for a factory at Walkerville to take care of Canadian demand.

Whitman & Barnes

DETROIT, March 3—Whitman & Barnes, Inc., has reported net loss of $300,755 after all charges, for year ended Dec. 31, 1931, compared with net loss of $184,271 in 1930. Current assets as of Dec. 31 were $863,287 and current liabilities $215,817, compared with current assets of $1,078,954 and current liabilities of $143,983 as of Dec. 31, 1930.

Petroleum Imports Up

NEW YORK, March 3—Imports of petroleum at the principal ports of the United States for the week ended February 20 have been estimated by the American Petroleum Institute at 254,429 bbl. daily. This compares with the daily average of 200,429 bbl. for the week ended Feb. 13, and with 219,857 bbl. daily for the four weeks ended Feb. 20.

Ford's Slowness Baffles Mills

Delay at Dearborn Disappoints Steel; Price Skirmish Seen

NEW YORK, March 3 — The steel market is disappointed by the slowness with which the first course on the Ford menu is being served. Activities of Mahoning and Shenango Valley finishing mills which, it is thought in the trade would be the first to benefit by Ford buying, show very little change from previous operating rates.

There is very little doubt that there is considerable disparity between what sheet and strip rollers think they should get for their products and what the Ford purchasing agents think they should be able to buy at, and the unknown quantity in the situation is the length of time it will take to iron out these differences.

Efforts made in February to give the price structure a firmer appearance were very likely prompted to some extent by anticipation of negotiations of this sort. It is not thought that Ford's production of steel will affect open market purchases any more than it has in the past.

Those who supply non-integrated rolling mills with sheet bars and other descriptions of semi-finished steel are now asking $27, the market lately having been on a $26 basis. An advance of $2 per ton in the price of cold-rolled strip is being essayed.

This brings the differential over hot-rolled to $10 from $8. A year ago it was $12. The 73, 10 and 10 per cent discount on bolts and nuts is gradually being withdrawn in favor of a flat 75 per cent discount.

Steel bars and shapes are now generally quoted by Pittsburgh district mills at 1.60 cents, Pittsburgh, as against 1.50 cents heretofore. No representative business has been placed at the new price which, therefore, remains to be tested in actual transactions.

Pig Iron—Shipments to automotive foundries continue satisfactory, but new business is mostly in small lots. Prices continue on a $15, Lake Furnace, basis with some shading in shipments into competitive territory.

Aluminum—The sole domestic producer announces that production at its plants will continue to be at a rate in excess of sales, so as to lessen unemployment and utilize hydroelectric power which must be paid for anyway. Price situation is unchanged.

Copper—A smelter offered electrolytic copper on Monday at 5¾ cents, Connecticut Valley basis. Consumers are not buying and sellers' prices are largely for quotation purposes. Prices of all copper and brass products have been revised downward in keeping with the decline in the basic metal.

Tin—Dull and unchanged. Straits for spot delivery is available at 22⅛ cents.

Lead—Reduction by the leading interest to 3.25 cents, New York, of the contract price served to steady the market and some timid consumers have begun to place long overdue orders.

Zinc—The market is back on its low record basis of 2.80 cents, East St. Louis, but the tone has turned more steady and hopeful.

Autocar Quick Assets Up

ARDMORE, PA., March 1—Autocar Co. for the year ended Dec. 31, 1931, reports operating loss of $612,228, after charging off $398,319 for depreciation and development expenses, attributable to reduced volume of sales. This compares with operating loss of $149,000 in 1930.

Balance sheet at the close of the year showed quick assets to liabilities in the ratio of 5.34 to 1, as compared with 4.50 to 1 at the close of 1930. This stronger ratio is due in large measure to reduction in inventories, R. P. Page, Jr., president, said.

At the annual stockholders' meeting William H. Brearley, secretary, was elected to the board of directors, succeeding J. B. Warren, resigned. Other directors were reelected. At the organization meeting of the board following the stockholders' meeting officers were reelected without change.

Federal Control of Trucks Hit

(Continued from page 397)

Committee of the National Automobile Chamber of Commerce, T. R. Dahl, vice-president of the White Motor Co., Cleveland, drew a distinction between business transportation, which handles one single "commodity," persons, on fixed schedules, and truck transportation, which handles a wide diversity of commodities and is privately operated and owned.

LaRue Brown, general counsel for the National Chamber, also opposed truck regulation by the Federal government and said it would result in discrimination against small shippers who could not buy their own trucks as against the large shippers who can.

Ivan Bowen, representing the Greyhound Lines and the National Association of Motor Bus Operators, urged regulation of motor vehicles using the public highways by joint boards set up by state regulatory committees.

Alfred P. Thom, Jr., general solicitor for the Association of Railway Executives, advocated Federal regulation of motor trucks and buses only insofar as the commission has the power to prescribe minimum rates. Regulation of both common carrier and contract carrier trucks was suggested.

Buick Ships 5386 Cars

DETROIT, March 1—Buick Motor Co. has reported shipments of 5386 units in February against 6365 in January and 7887 in February last year.

F. A. Warren Heads Canadian Company

F. A. Warren, treasurer, has been elected president of the Gutta Percha & Rubber Co., Ltd., to fill the vacancy caused by the death of the late C. M. Candee.

Parts, Accessories In Seasonal Gain

M. E. A. Index Shows Increase Over December; Drops Under January, 1931

NEW YORK, March 2—Sales of motor parts and accessories during January showed a seasonal increase, according to the monthly business figures of the Motor and Equipment Manufacturers' Association, but fell considerably behind January of last year.

Original equipment sales during the month amounted to 63 per cent of the January, 1925, figure used as a base for these compilations. This compares with 59 for December and with 84 for January, 1931. Sales of service parts during the month were 96 per cent of the base figure, as compared with 94 in December and with 98 in January a year ago.

Accessory sales declined during the month from the previous month's figure but were better than a year ago, as witnessed by the index of 57 for January of this year, as compared with 66 in December and 46 in January, 1931. Service equipment index for January was 56, as compared with 49 in December and 92 in the previous year.

As a result of this business, the grand index for the month was 67. This compares with 64 in December, 1931, and 84 in January, 1931.

Huge Tax Savings To Motorists Seen

(Continued from page 397)

which promised to strike out the taxes. It also received strong support from many organizations, including agricultural groups.

Even stronger protests were made against the proposed 1 cent tax on gasoline. It is not likely this proposal would have received anything like a sufficient vote in either house for its passage.

It is hoped to enact the new revenue legislation by the end of the present March. The House likely will get the bill on Saturday of the present week or early next week.

Graham Production Up

DETROIT, March 1—Graham-Paige Motors Corp. has reported February production totaling 2095 units, of which 1902 were eight-cylinder.

Retail sales covering the period from Jan. 1 to Feb. 20 showed a gain of 12 per cent over the corresponding period last year.

Bucyrus-Erie Income Is Less

CHICAGO, March 1—Bucyrus-Erie Co. for 1931 shows net income of $823,977, to compare with net of $2,439,461 in 1930.

Acme Photo

The New Baby Ford

The New Ford 8 hp. "baby car" was the center of attraction during the Ford Motor Show which recently opened in Albert Hall, London. Here is part of the crowd that swarmed around the car to give it a thorough inspection

Wilmington Show Is Held Success

30,000 See New Models, Many Buy

WILMINGTON, DEL., Feb. 29—Wilmington's 17th annual automobile show, which closed last Saturday night after a week's run, was gratifying to all concerned. "With better than 30,000 people attending the show during the week, the committee," Hugh Gallagher, chairman, said, "feels that the results have been very satisfactory.

"Practically all of the exhibitors reported that they received the largest number of active prospects that they have ever secured at any show for a number of years. We feel, considering the actual number of sales made and the optimism displayed by all the dealers participating, that the auto business is on the upward trend, and we look for a better year than last year."

This sentiment was indorsed by T. Coleman Johnson, president of the Delaware Motor Trades Association, which sponsored the show. Individual exhibitors spoken to regarding the show were of the same opinion.

Willys-Overland Shipments Gain

TOLEDO, March 1—Willys-Overland shipments for February were 87.7 per cent more than January, and the largest month since business was stimulated by lower prices, and was 51 per cent above the average for last eight months.

Some special jobs and types of bodies were increased $15 a car today, but base price of $415 on Six remains in effect and no change in dealer discounts. Miller reported 142 new dealer and distributor contracts in last six weeks. Seventy-seven per cent of February business was on Sixes.

Northwest Air-Ways Orders Radio Phones

CHICAGO, March 1—Northwest Air-Ways has ordered over $50,000 worth of radio telephone units from Western Electric Company to complete its program of equipping landing fields and planes with two-way radio telephone service. Four ground stations and 17 planes will be equipped.

Hugh R. Corse

Hugh Reginald Corse, 52, sales manager, Lumen Bearing Co., Buffalo, died Feb. 20 at his home.

In 1905 he was engaged in the radiator business, automobile manufacturing and selling. Five years later he joined the Lumen Bearing Co.

He was active in automotive circles, was an active member of the Society of Automotive Engineers and worked on the S.A.E. committee on non-ferrous alloys. He was a charter member of the Detroit Athletic Club, a member of the Buffalo Engineering Society and other technical organizations.

Denmark Hard Hit, Show Postponed

Foreign Exchange Rate, Unemployment Factors

COPENHAGEN, DENMARK, Feb. 22—The automobile show which was to have been held here, Feb. 26 to March 6, was postponed owing to the economic crisis under which the countries of Northern Europe are suffering. Importers held the show would be of no advantage to them because they would be unable to buy foreign exchange to pay for automobiles bought abroad to fill orders that might be placed at the show. The number of unemployed in Denmark reached 136,809 on Jan. 15, the largest number in history.

Wilcox-Rich Net is Down

DETROIT, March 1—Wilcox - Rich Corp. reported net profit of $394,375 for year ended Dec. 31, 1931, equivalent to $7.92 per share on 49,800 no par shares of Class A stock, exclusive of 12,322 shares held in the treasury. This compares with a net profit of $775,389 in 1930, equal to $12.58 a share on 61,637 Class A shares, excluding 485 shares held in treasury.

Bendix Reduces Dividend Basis

CHICAGO, March 1—Bendix aviation was placed on a 60 cent annual dividend basis by declaration yesterday of a 15-cent quarterly disbursement payable April 1 to stockholders of record March 10. This marks a reduction from a previous $1 annual basis.

No official comment accompanied the announcement, although it was understood the action was taken to preserve working capital. Current disbursement will make a total of 90 cents for the last year, and is about in line with estimates on net income for the period.

Detroit Gets Joint M.E.M.A.-N.S.P.A. Show

NEW YORK, March 1—The Third Joint Trade Show of the Motor & Equipment Mfrs. Association and the National Standard Parts Association will be held in Convention Hall, Detroit, during the week of Dec. 5. Last year the show was held in Atlantic City and in 1930 in Cleveland.

Reo Sales Gain

DETROIT, March 1—Reo Motor Car Co. has reported that registrations of new Reo trucks in 34 states reporting for January show an increase of 28 per cent over January last year, making the seventh consecutive month that Reo truck registrations have shown a gain over the corresponding period last year.

Fear Hazard Is Lessened

R. G. Dun Economist Holds Fewer Failures Is Sign of Improvement

NEW YORK, March 3—The early weeks of 1932 have seen definite progress in overcoming the "fear hazard," according to Stephen I. Miller, director of economics, R. G. Dun & Co.

"As a result of present economic difficulties two distinct schools of thought have come to the front; one would let things automatically work themselves out, the other would do the most expedient thing to aid recovery. Congress and the administration have decided to proceed with the positive interpretation," he said.

"The purpose of the Reconstruction Finance Corp. rises above argument. It strikes at the root of the trouble, and not at the branches. It aims to help worthy financial and industrial institutions, arresting failures, and returning hoarded money into circulation.

"The Glass-Steagall bill provides for emergency credit. It should be recognized that the evil in deflation may be just as great as in inflation. A drought may be as bad as a flood. Water may be used to prime a pump and it may be necessary to release more credit in order to start a flow.

"It is as foolish to argue against an increase of credit at this time, as it would be to oppose rain in time of a drought. Such legislation is not inflation, and it never could be, until our normal credit facilities are restored. What is more, it has a double safeguard—one, in the control of the Federal Reserve System—the other, in its time limitation.

"The constructive credit legislation of the past few weeks has given notice to the world that the United States intends to maintain its gold standard. In the days to come this stand of the United States will be held as one of the heroic events at a time of economic chaos.

"With legislation scarcely under way, bank failures have been reduced by more than one-half, primary markets strengthened, and considerable hoarded money returned to circulation."

Unit Corp. To Reorganize

MILWAUKEE, Feb. 29—The Unit Corp. of America, manufacturing automotive forgings, transmissions, power shovels, etc., has submitted to a receivership in the Milwaukee county circuit court as the result of an agreement between company officials and creditors.

J. Seton Gray, Milwaukee engineer, and M. A. Goldsmith, one of the corporation's underwriters, have been named coreceivers.

Efforts at reorganizing the company have been under way several months, and will be greatly facilitated by the receivership, it is stated.

The Unit Corp. represents a $2,000,000 merger of a number of concerns, including the Fuller & Sons Mfg. Co., Kalamazoo, Mich., and the Universal Power Shovel Co., formerly of Detroit. Main plant and offices are in West Allis, suburb of Milwaukee.

Reeder is Cadillac Advertising Manager

John F. Reeder has been appointed advertising manager of the Cadillac Motor Car Co., succeeding Trueman F. Campbell, who has joined the staff of the Campbell-Ewald advertising agency.

His entire business career has been spent in the advertising field. Starting with the United States Advertising Corp., Mr. Reeder subsequently

John F. Reeder

joined the staff of P. P. Willis, Inc. His connection with the Campbell-Ewald Co. dates from 1927 and during his service with this organization he handled and directed the advertising programs of many of the General Motors accounts.

Reeder is a graduate of Dartmouth College, where he won considerable fame some years ago as a halfback on one of the best football teams Dartmouth ever turned out.

Turks Remove Import Quotas

WASHINGTON, March 3—The Turkish quota import restrictions on truck chassis (with or without motor) and on tires and tubes have been removed, according to a radiogram from Commercial Attache Frederick B. Lyon, Istanbul, in informing the Department of Commerce of quotas for imports of restricted products into Turkey during April, May and June.

No restrictions are to be imposed on the importation of lubricating oils, pumps and parts, and automobile springs and axles.

Monthly quotas in kilos (kilo equals 2.2406-lb.) for April, May and June include the following: Passenger automobiles weighing from 1300 to 1750 kilos, 13,000 each month; parts of passenger car chassis, 3161, 6964, 2790.

Used Car Prices Show Decline

Louisville Dealer Executive Finds Averages Down $83

LOUISVILLE, KY., March 1—The Louisville Automobile Dealers Association shows that the average sales price of used cars has dropped off $83.73 during the past five years.

In a report of used car sales J. Garland Lea, secretary, shows these averages:

1927, $305.80; 1928, $288.15; 1929, $259.22; 1930, $238.52; 1931, $222.07.

In January, 1932, average for 562 cars was $187 per car, as against $209 for January of 1931. It is rather clearly indicated that used car values will work lower in 1932, and the dealers may just as well make their plans accordingly, and trade on a more narrow margin, he says.

G. M. Trucks Show Gain

DETROIT, March 3—General Motors Truck Co. reported that figures for January show an increase of 54 per cent in deliveries over the same period a year ago at branch and distributor points representing the largest metropolitan areas in the country.

Records for 1931 show a steady increase in percentage of price class business secured by General Motors Truck Company leading up to 12.9 per cent recorded for December. Percentage of competitive business secured for the last half of 1931 was nearly double that of the first half.

Railcar Is Tried On British Line

WASHINGTON, March 1—A Diesel-electric railcar, in a trial run over a section of the London & North Eastern Railway Co. track, established a speed of 60 miles an hour on level portions, according to a report from Consul William F. Doty, Newcastle-on-Tyne, made public by the Commerce Department.

The section of the line used has very steep gradients, the report said. The Diesel-electric railcar averages 23 miles an hour on the grades.

German Automobile Exports Show Gain, Although Increase in Value Only Moderate

BERLIN, Feb. 20 (*Special*)—German exports of automobiles increased considerably during 1931, but the gain in numbers of cars exported was accompanied by a very severe decrease in the average value, so that the gain in the value of motor exports is only moderate.

The decrease in the value per unit exported probably is largely due to price-cutting, although there is no doubt that small cars figured more largely in the exports during 1931 than during previous years.

Passenger cars exported numbered 8332, as compared with 3898 in 1930, and their value amounted to 24,850,000 marks, as compared with 21,720,000 marks. Exports of motor trucks increased from 1927 in 1930 to 3213 in 1931, and the value of exported trucks from 15,670,000 marks to 20,140,000 marks.

Motorcycles were exported to the number of 7082, about the same as the previous year, but the value of the exported motorcycles decreased from 6,020,000 to 4,780,000 marks. The value of parts and accessories exported was 10,670,000 marks and that of engines, 3,790,000 marks, making the total automobile exports for 1931, 63,810,000 marks, as compared with 56,980,000 marks in 1930.

Imports of automobiles into Germany dropped to less than half during the past year, the total value having fallen from 70,920,000 to 34,010,000 marks. These figures include the values of parts imported for assembly in Germany by non-German manufacturers. There were imported 3262 passenger cars and chassis, 110 trucks and 1841 motorcycles.

The decrease in activities at assembling plants of non-German manufacturers in Germany is indicated by the heavy decrease in the imports of engines and parts, the number of engines imported having decreased from 21,067 in 1930 to 6651 in 1931, and the tonnage of parts from 12,000 to 6805.

While German foreign trade in automotive products showed an unfavorable balance of approximately 14 million marks in 1930, it showed a favorable balance of approximately 21 million marks in 1931.

Eastern Asia Up In U. S. Exports

China Seventh Place Instead of Tenth Now

NEW YORK, March 4—Export trade in Eastern Asia has gained ground during the depression. The volume of our exports to Japan, China and India, the National Foreign Trade Council points out, is more than 6 per cent greater for 1931 than for 1930, in contrast to the fact that the volume of American export trade, as a whole, diminished by more than 20 per cent during this same period.

The outstanding case of our increased trade in the Orient is that with China, where we sold products worth $98,000,000 last year compared with sales of $90,000,000 the year before, the only important gain made during 1931 in our export commerce, which raises China from tenth to seventh position among the purchasers of American products.

Quebec to Limit Truck Passengers

QUEBEC, Feb. 18—The Legislative Assembly today adopted in third reading a bill limiting the transport of passengers in motor trucks. Ten persons is the maximum under the amendment to the Motor Vehicle Act, with exceptions for employees traveling to work or returning in the vehicle owned by their employer. The law aims at ridding the highways of large trucks jammed with people, often traveling at high speed and endangering travel.

Production Drops 2% in January

119,344 Motor Vehicles Built During First Month

WASHINGTON, March 3—Production of motor vehicles in the United States in January declined to 119,344 units from 121,541 in December, a drop of about 2 per cent, according to the Bureau of the Census.

The January output comprised 98,753 passenger cars (an increase of almost 2000 over December), 20,541 trucks and 97 taxicabs. The Canadian output of motor vehicles in January was 3731, consisting of 3112 passenger cars and 619 trucks. This represented an increase from 2432 units produced in December.

Recommends Selling By Shop Mechanics

DETROIT, March 3—In a letter to Reo distributors and dealers, E. J. Poxson, general sales manager, Reo Motor Car Co., recommends a plan for increased service business.

"Rather than reduce the pay of service employees," Mr. Poxson says, "why not give them a list of car owners in the vicinity of the employee's home and instruct them to spend an hour or two each evening calling on them, inspecting their cars and selling them the idea of calling at the service station for necessary adjustments."

Each man is to get a commission on all the jobs thus brought in. Mr. Poxson believes that the plan might also possibly be extended to clerks and stenographers employed by the dealer, as well as service men and salesmen. He believes that many a new car prospect could be weeded out by a systematic campaign of night calls.

Automotive Advertising Shows Slight Loss

NEW YORK, March 1—Automotive advertising in national magazines amounted to $1,781 for February, only 0.4 per cent less than the figure of $1,788,786 for the same month last year, according to figures compiled from National Advertising Records by Dorrance, Sullivan & Co., New York advertising agents.

Radio broadcast advertising over national networks increased from $133,883 in January, 1931, to $232,267 in January, 1932, a gain of 73.5 per cent. In spite of this gain the total for national magazines, farm magazines and radio in January was $944,871, 22.9 per cent less than the amount spent in January, 1931.

John G. Osborne

John Goodrich Osborne, 53, vice-president, Lakeside Malleable Castings Co., Racine, Wis., widely known in the automotive and implement industries, died in Milwaukee on Feb. 24 from pneumonia.

Yellow Truck Shows Loss

PONTIAC, March 1—Net sales of Yellow Truck & Coach Mfg. Co. for the year ended Dec. 31, were $26,948,154, and net loss, after provision for depreciation, was $2,762,335. In the year 1930 the company reported a net profit of $1,115,415.

John Pugh, Jr.

John Pugh, Jr., 51, for many years with the J. I. Case Co., Racine, Wis., died Feb. 22 after an illness of nearly four years. He was a pioneer in the designing of gasoline and oil tractors and during the World War made an enviable reputation for the Case Co., especially in production.

Hupp Production Up

DETROIT, March 1—Hupp Motor Car Corp. has reported production of 1527 cars in February, compared with 1049 in January and 1908 in February last year.

Parker Shows Profit

DETROIT, March 3—Parker Rust-Proof Co., Detroit, has reported a net profit of $449,070 after all charges, for year ended Dec. 31, 1931.

Seiberling Flays Slashed Pricers

Additional 10% Cut to Large Accounts Hit by Manufacturer

AKRON, O., March 3—Another 10 per cent reduction in prices of automobile casings to the larger commercial accounts was placed in effect by the larger tire manufacturers this week. The reduction was attacked by F. A. Seiberling, president of the Seiberling Tire & Rubber Co., as "another step toward taking the legitimate tire market away from the independent retail dealers of the country."

"If the larger manufacturers expect to continue such reductions to the larger accounts," Mr. Seiberling said, "the 75,000 independent retailers of the country should at least be given the opportunity to liquidate before they are crowded out of business by the company owned stores, the chain gas and tire stations and the mail order houses."

The 10 per cent commercial account cut was said by officials of the larger companies not to affect the retail prices of tires, but Seiberling and officials of other small factories of the Akron district characterized it as "one more step in the general scheme to crowd out the small independent retailer and force the smaller factories with no company owned retail stores out of competition."

Managers of a score of retail tire stores in the Akron district joined the smaller manufacturers in a protest against the new price cut.

Michigan Sales Off 31% for Month

DETROIT, Feb. 29—A 31 per cent decrease in Michigan passenger car registrations for January, 1932, as compared with January of last year, is largely accounted for by a 71 per cent decrease in Ford sales. With Ford eliminated there is a decrease of only slightly over 12 per cent. Total January registrations were 4,137 as against 5,993 in January, 1931, and 4,872 in December.

The largest decrease in registrations from December to January, however, was recorded by Chevrolet with registrations of 1,492 as against 2,081. Buick registrations also showed a loss with 254 in January against 652 the previous month. With Ford and Chevrolet eliminated January registrations actually showed a gain over the previous month. Improved sales were recorded in the following lines: Dodge, Essex, Graham, Hudson, Hupmobile, Lincoln, Marmon, Oldsmobile and Pontiac, reflected by the introduction of new models. As compared with January, 1931, improved sales were recorded in the DeSoto, Graham, Hupmobile, Lincoln, Pierce-Arrow, Plymouth, Studebaker.

Commercial registrations were 476 against 767 in January last year, a loss of 37 per cent. Ford was first with 179, Chevrolet second with 176, and International third with 27.

Imperial Oil Co. To Sell Batteries

Comprehensive Guaranty To Cover "Acto" Brand

TORONTO, March 3—Imperial Oil stations will soon have for sale storage batteries with a guaranty as comprehensive as the Atlas tire warranty. They will be distributed first in Eastern Canada, and as production grows will gradually be introduced in other territories until the entire Dominion is covered. The battery will be marketed under the name of "Acto," and will carry an 18-month guaranty for passenger cars and nine months for trucks.

Favors 6-Hour Day for Workers

AKRON, O., March 3—Paul W. Litchfield, president, Goodyear Tire & Rubber Co., went on record this week favoring a six-hour day for industrial workers as a means of providing more jobs for men now out of work.

Goodyear has tried out several plans in the last two years, he said, and is now running four six-hour shifts daily, six days a week. The main factory here employs about 17,000 men.

If the six-hour day plan were adopted generally, wherever possible, millions of men now out of employment would be given jobs that would make them self-supporting, Mr. Litchfield said.

31 States Show Sales Off 34%

January Registrations May Reach 74,400, Trucks Estimate 13,100

DETROIT, March 3—Sales of new passenger automobiles in January in 31 states, representing 67.39 per cent of the entire country, show a decline of 34.48 per cent from the number of cars sold in the same states in the same month a year ago, according to R. L. Polk & Co. January sales totaled 50,122 units as against 76,497 units a year ago. However, the sales for January are only 4.11 per cent under the December, 1931, figure of 52,272 units for the same states.

If the same rate of sale is maintained throughout the country, the total sale for the month is estimated at 74,400 units as against 77,564 units in December.

Reports on new truck sales in 32 states, representing 67.95 per cent of the country, according to the Polk Company, show 8896 units sold in January.

This total is 42.61 per cent under the record of 15,501 units for January a year ago, but less than one per cent under the figure of 8954 units for December, 1931, in the same states.

Based on reports so far available, the total new commercial cars sale is estimated at 13,100 units for January.

Airways Cuts Fares

NEW YORK, March 3—The American Airways, Inc., announced a general reduction of passenger fares throughout the entire American Airways system, effective March 1.

+ + CALENDAR OF COMING EVENTS + +

SHOWS

Salon, San Francisco, Calif..Feb. 27-Mar. 5
Albany, N. Y., Automobile..Feb. 27-Mar. 5
Berne, Switzerland, Automobile..Mar. 11-20
National Aircraft, Detroit, Mich..Apr. 2-10

FOREIGN SHOWS

Copenhagen, Automobile ..Feb. 26-Mar. 6
Lyons, France, Passenger and Commercial .....Mar. 7-20
Geneva, Switzerland, Passenger and Commercial .....Mar. 11-20
Vienna, Passenger and Commercial .....Mar. 13-20
Tel Aviv, Palestine (Levant Fair) .....April 7-30
Milan, International Automobile Salon .....April 12-27
Zagreb, Jugoslavia, Automobile Salon .....April 23-May 2
Peznan, Poland, International Fair .....May 1- 8
Dublin, Commercial .....May 4- 7
Budapest, International Fair...May 7-16
Belfast, Commercial .....May 25-28
Bordeaux, Fair .....June
Cork, Commercial .....June
Inverness, Commercial .....June 21-24
Southampton, Commercial .....July 5- 9
Llandrindod, Wales, Commercial .....July 20-22
London, Olympia Show .....Oct. 13-22
Glasgow, Scottish Motor Show..Nov. 11-19

CONVENTIONS

American Railway Asso., Chicago .....March 15-17
Southern Automotive Jobbers Asso., Atlanta, Ga. .....Mar. 16-19
Society of Automotive Engineers (Aeronautic Meeting), Detroit..April 5-6
American Welding Society, Annual Meeting, New York City.....Apr. 27-29
American Society Mechanical Engineering (Management Div.) Philadelphia .....May 2-6
American Gear Manufacturing Asso., Cleveland .....May 12-13
U. S. Chamber of Commerce, San Francisco, Calif.....May 16-20
National Battery Mfrs. Asso., Chicago, Ill. .....May 19-20
American Society Mec. Eng.(Natl. Aeronautic Meeting) Buffalo..June 6-8
American Society Mec. Eng.(Natl. Oil & Gas Meeting) State College, Pa. .....June 8-11
National Safety Council, Washington, D. C. .....Oct. 3-7

No matter what the style trend . .

the demand is always for STEEL!

Will the wire wheel hold the spotlight? Will the trend be to the disc? Or will the artillery take first place? . . . It is difficult to tell. But this one thing is certain:—no matter what type of wheel is the favorite, motorists will want that wheel in STEEL. . . . The country has definitely gone *steel-wheel.* Fully 90% of all the 1932 cars will be riding on steel wheels. Why? Not for strength alone. Not only for greater safety. But also because steel is modern. Steel is beautiful. Steel is style . . . Budd—the only manufacturer of STEEL wheels exclusively—offers a wheel to meet every new trend, whether it be to wire, disc or artillery.

BUDD WHEEL COMPANY

Detroit **Philadelphia**

Makers of BUDD-MICHELIN WHEELS

★WHEELS BY BUDD★

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

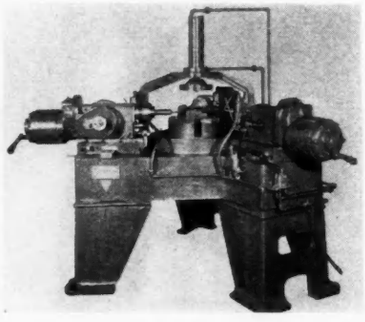
Two Machines for Clutch Plates

Millholland Corp., Indianapolis, Ind., announces two new machines for automobile clutch plates, one to straddle mill three ears simultaneously without indexing the piece and one to drill and ream three pin holes simultaneously without indexing. Greater accuracy and lowered production time is claimed for these machines. Both machines are readily adjustable to take different sized clutch plates on the same machine.

A full view of the milling machine shows the method of construction. Three motor-driven milling units are placed 120 deg. apart on a circular bed and are adjustable on bases to accommodate larger pieces. A 10 in. air cylinder extending down into the bed maintains a constant pressure at all times on the lower plunger and provides the pressure against which the cam on the No. 5 Millholland automatic unit clamps the piece and feeds it down past the three sets of straddle milling cutter.

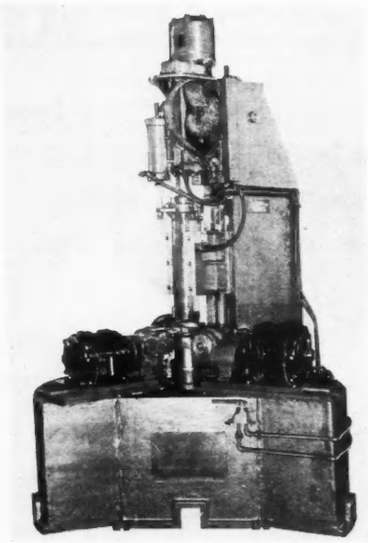
Three chip funnels are located directly under the cutters, and are connected to large pipes leading out through the bed to openings in the back allowing chips to flow out by gravity to chip boxes in the rear.

Cutter adjustment is provided by means of a hollow spindle in which



the cutter arbor is carried. A single spacing collar back of the shoulder on the arbor provides for sideways adjustment of the group of three cutters.

Adjustment of speed of cutters can be obtained by changing the pickoff spur gears in the spur and worm drive to the milling spindle. Length of stroke or rate of feed can be accomplished by a change of cam or pickoff feed gears on feeding unit.



The drilling machine consists of three No. 3 Millholland automatic drilling units each equipped with a combination drill and reamer. One air valve engages the feed on all three drilling units simultaneously after the piece has been clamped by air plunger. Accuracy of spacing is said to be achieved by this method as the piece does not have to be removed from machine to be reamed. Even stepped holes can be drilled and reamed accurately.

To move the unit dovetail bases into position for larger pieces, the bases are mounted on large flat keys, with bolt holes drilled in the base for approximate new locations.

Oil and Fuel Filters

Motor Improvements Co. of Newark, N. J., showed at the New York Automobile Show a complete line of its oil and fuel filters which it markets under the trade name of Purolator. As regards oil filters for automobile use, the company some time ago adopted the helical filtering element in which the fabric bag is placed on the outside of a helical wire spring which is supported or reinforced by plates at the ends. There is a spool through the center through which the filtered oil flows off. A single thickness of specially made filtering cloth is used, with a heavy nap and a heavy porous backing. The nap collects dirt particles and thus builds up a slime bath.

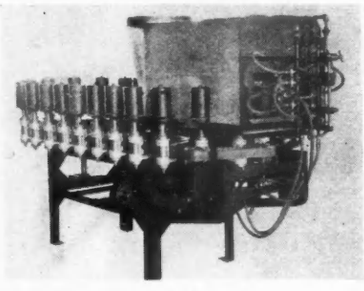
In addition to this cloth filter the company manufactures a metal-edge, continuous slot filter. The filtering element of this unit is made up of a metal ribbon having slight risers on one side. This ribbon is formed into a close-wound helix resembling a tube, and then has a continuous helical slot extending from end to end, through which the fluid being filtered must pass. This type of filter lends itself well to construction in very compact form, as required for insertion in spray nozzles of Diesel engines, for instance.

Another new product is a gasoline hose filter which is particularly adapted for use at air-field filling stations. This has a capacity of between 15 and 20 gal. per min.

Motor Improvements Co. also manufactures an air separator which has been found useful in autobody finishing plants. Where lacquer is being sprayed it is essential that the air be free of moisture and oil, otherwise the coat is likely to be streaky or to show other imperfections. This separator is claimed to deprive atmospheric air of both moisture and oil vapor or mist. The separator is being used also in pneumatic installations in factories, since moisture in air-chucks, for instance, is likely to rust them.

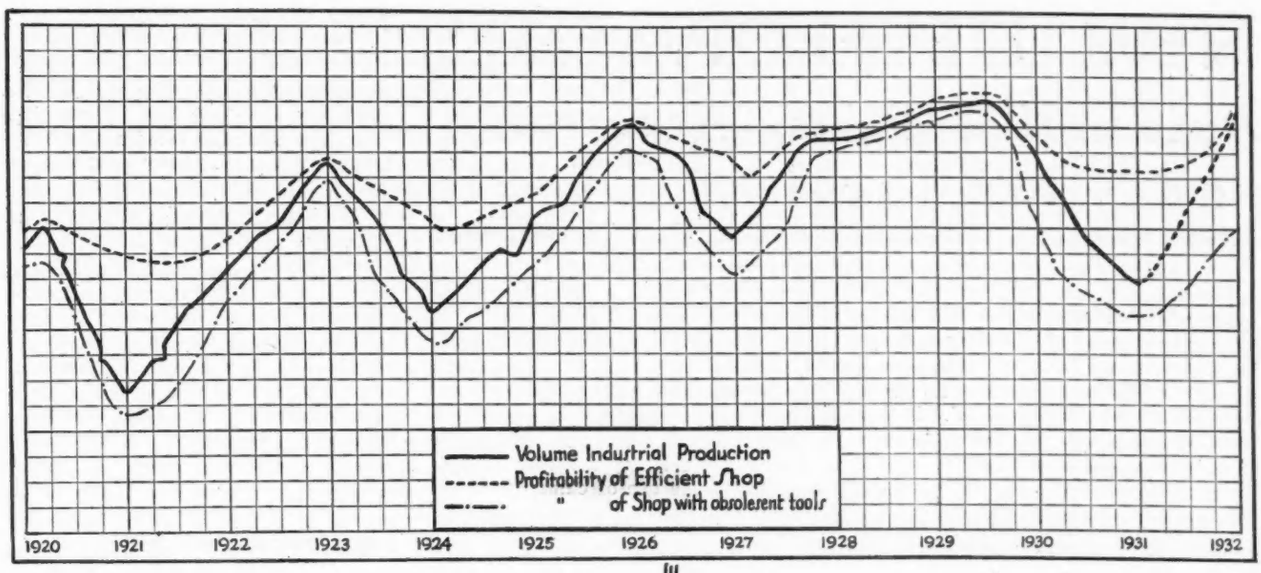
DeVilbiss Automatic Spray Equipment

Hand-operated spray guns have long been used in the industrial finishing field. Automatic spray equipment, which is a recent innovation in the industrial finishing field has gained a place which is giving it wide manufacturing recognition. Results show that automatic spray-finishing installations have reduced manufacturing costs, saved material and cut labor charges.



The illustration shows a generator finishing machine which is entirely automatic and requires no spray operator. The generators pass under a group of DeVilbiss automatic spray guns which spray the finishing material over the product in the required manner. Production costs are lowered and labor charges are negligible.

(Turn to page 408, please)



OBSOLETE

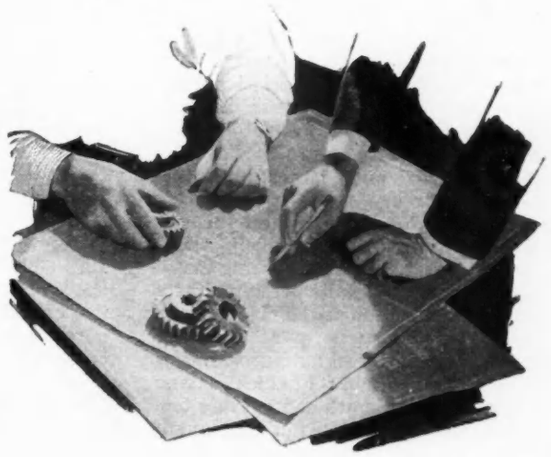
Equipment Will Not Earn Profits

— *Any Time* —

Are you modernizing your production equipment in order to be ready when better business returns? You will never have a better opportunity.

Manufacturers who have followed a consistent replacement policy have best weathered the present period of reduced operations, and will be in an enviable position when conditions reach normal.

How about your gear department? Fellows Gear Shaper equipment will unquestionably improve your production of acceptable gears. Improvements instituted now will be worth twice what they cost you when business improves. Why not ask to have one of our representatives call and help you make an analysis of your problems. No obligations. THE FELLOWS GEAR SHAPER COMPANY, 78 River Street, Springfield, Vermont; 616 Fisher Building, Detroit, Michigan.



FELLOWS
~ GEAR SHAPERS ~

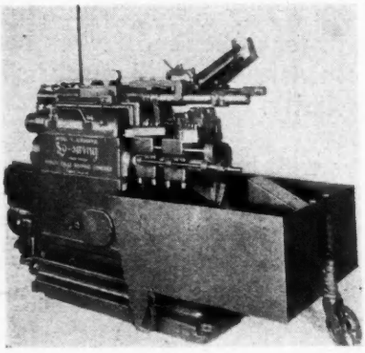
NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools

"K" Lo-Swing Lathe

Automatic loading and unusual design feature the model "K" Lo-swing lathe brought out by the Seneca Falls Machine Co., Seneca Falls, N. Y. It is designed primarily for short, stubby work such as ball bearing races, gear blanks, and the like that can be handled on an arbor or in a chuck.

The arrangement shown here takes races from $1\frac{5}{16}$ to 5 in. in diameter.

It is equipped with an automatic device arranged to load roller bearing races onto a stub arbor where they are held while being machined. After the race has been completed, it is ejected from the stub arbor hydraulically and separated from the chips, which fall into the chip truck. The races are conducted through the chute into the square hole shown over the wheel of the chip truck. A tote box or other receptacle can be placed here for finished work. The entire loader is operated hydraulically and safety features are incorporated to protect machine in case of accident.



This machine is of heavy design, weighing approximately 8700 lb., and is built for high speed, it being practical to run the spindle up to 2000 r.p.m. if desired. Anti-friction bearings are used throughout and all shafts and gears that are subjected to any amount of wear are hardened so that long life and low maintenance cost is assured.

The feed for the tool mechanism is obtained through cams which, acting through arms, impart a rocking movement to the 6½-in. diameter tool bars which extend through the machine and carry the tool supports at the outer end. Additional tool actuating means is provided by shafts which extend through the tool bars and operate tool slides when desired. To take an angular cut, the tool bar may be rocked into position where it is securely held and then by this additional feeding mechanism, the tool slides can be advanced at any desired angle and rate of feed. This is of considerable use in machining bevel gears.

While all feeding movements are obtained by the use of cams, the control mechanism for throwing the machine into and out of rapid traverse, opening and closing chuck, returning tool slides, etc., is hydraulically operated. The use of hydraulics in this connection simplifies the construction of the machine to a large extent and makes for longer life.

Pick-off gears are provided for feed, rapid traverse and spindle speed. The machine can be furnished without the loader as a hand operated machine or can be equipped with any other automatic loading arrangements. When equipped for hand loading the machine is started by pressing a lever, after which it will go through a complete cycle and then stop. When equipped with automatic loading the cycle is continuous.

New Greylock Eagle Brake Lining

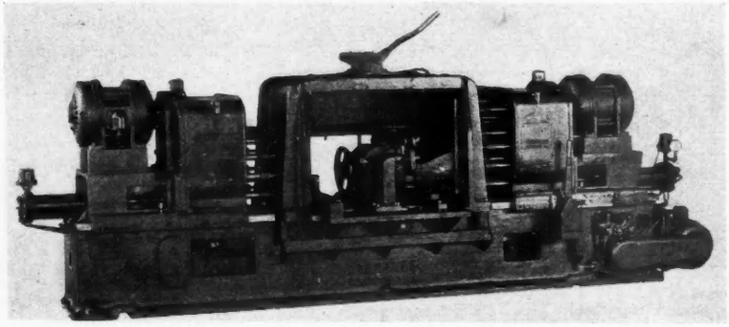
The United States Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Pa., has announced a new Greylock Eagle brake lining specially developed for cars equipped with free wheeling. This lining is being manufactured by a new process developed by United States Asbestos Division, by which it is said to be possible to introduce in the lining elements that previously were found only in molded brake linings. The alloy-wire principle, the smooth-ground surface and other features of Greylock Eagle brake lining are retained. The manufacturers state that they have conducted exhaustive experiments with the new lining for about a year.

New Type Workhead

As an optional feature at slight additional cost, the City Machine & Tool Works, Dayton, Ohio, has developed a new type workhead drive for the Model No. 3 Peerless Chamfering Machine. Instead of utilizing a combination geared head reduction motor, this drive separates the reduction unit and the motor and permits the use of a standard motor which drives to the reduction unit by means of "V" belts. An additional advantage is that this enables changing the operating speed of the workhead to secure maximum results for each type of operation, rather than setting the machine workhead to one given operating speed.

Greenlee Multiple Drilling Set-Up

Another adaptation of a high production set-up for moderate production requirements has been developed by the Greenlee Bros. & Co., Rockford, Ill. The multiple-spindle machine shown here drills 31 holes in the cylinder block and six in the radiator support bracket for a large tractor builder. Both operations are accomplished without changing a single drill. The only change necessary is to mount an auxiliary fixture on the base of the large cylinder block fixture when drilling the radiator bracket. This is shown set up inside the main fixture.



Since both pieces are drilled in the same machine, a considerable saving in the capital investment was made. After a sufficient number of cylinder blocks are drilled, the auxiliary fixture is mounted on the top of the fixture base. Then a number of radiator support brackets are drilled, being located in their proper position by clamping with the two handwheels shown. Without further adjustment the machine goes through its cycle of drilling six holes in one operation.